UNESCO KALINGA LAUREATES
for
UNIVERSAL PEACE

रविप्रौसंप NCSTC

सत्यमेव जयते

Project Sponsored by :

National Council for Science & Technology Communication (NCSTC)
Department of Science & Technology (DST)
Ministry of Science & Technology
Govt. of India, New Delhi

Compiled & Published by :

Kalinga Foundation Trust
Bhubaneswar, Odisha, India

UNESCO Kalinga Laureates for Universal Peace

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Government of India

Fully Funded by

Government of India
Department of Science & Technology

Technology Bhawan, New Mehrauli Road
New Delhi - 110016

UNESCO Kalinga Laureates for Universal Peace

Published by

Kalinga Foundation Trust
Bhubaneswar, Odisha, India

Compiled & Edited by

Dr. Chitta Ranjan Mishra
Kalinga Foundation Trust
Bhubaneswar

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Ms. Shashi Ahuja
Director & Scientist F
Department of Science & Technology (DST), Govt. of India, New Delhi

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Year of Publication
2012

KALINGA FOUNDATION TRUST

(EXEMPTED U/s 80 G (5) (vi) OF INCOME TAX ACT 1961)
REGISTERED UNDER THE SOCIETIES REGISTRATION ACT 1860
Registration No. 282/47 of 1959-60, PAN No. AAATK 2285 P, TAN No. BBNK 01179 D
Website: www.kalingafoundationtrust.com; E-mail: kalingafoundationtrust@yahoo.in
Kalinga Bhawan, A/82/1, Nayapalli, Bhubaneswar-751 012, Tel.: (0674) 2394454

First Board of Trustees of Kalinga Foundation Trust which was registered under Societies Registration Act, 1860 (No XXI of 1860) by the Registrar of Companies, Orissa on 28.11.59. had the following members, who have all expired now.

1.	Dr. Harekrushna Mahatab	:	Chief Minster, Orissa - - - Chairman
2.	Sri Nabakrushna Choudhury	:	Ex- Chief Minister, Orissa - - - Trustee
3.	Sri Bijoyanand Patnaik	:	Industrialist - - - Managing Trustee
4.	Sri Bir Pratap Sing Deo	:	Yubaraj, Sonepur - - - Treasurer
5.	Sri Sadhucharan Mohanty	:	Retired District and Sessions Judge - - Trustee
6.	Sri Biren Kumar Mitra	:	Ex-President, Utkal Pradesh Congress Committee- - - Trustee
7.	Mrs. Gyan Patnaik	:	Industrialist - - - Trustee

Subsequently, Sri Nilamani Routray, Ex-Chief Minister, Orissa was also the Chairman who has now expired. Sri Chandra Mohan Singh, Ex-Minister, Orissa and Sri Kamini Kanta Patnaik, Advocate were the Managing Trustee who have also expired on 12.5.2002 and 11.7.2011 respectively.

The present Trust Board Members are:

1.	Sri B. C. Pattanayak	:	Ex- Member of Parliament - - - Chairman
2.	Sri P.K. Samal	:	Ex- Minister - - - Managing Trustee
3.	Sri Bimal Das	:	Jt. Managing Trustee & Treasurer
4.	Sri P. C. Ghadai	:	Ex-Minister - - - Trustee
5.	Sri U. C. Mishra	:	Trustee
6.	Sri D. N. Patnaik	:	Trustee
7.	Chairman, Industrial Development Corporation of Orissa Limited (IDCOL)	:	Trustee
8.	Dr. Chitta Ranjan Mishra, Senior Scientist	:	Trustee
9.	Dr. Omkar Nath Mohanty, Retired Vice-Chancellor, BPUT, Rourkela	:	Trustee
10.	Sri A. N. Mishra, IRS, Retired Chairman, Direct Tax Board	:	Trustee

Special Invitees:

1. Dr. (Mrs.) Shashi Ahuja, Director, Department of Science & Technology (DST), Govt. of India
2. Dr. S. K. Tamotia, Retired CMD, National Aluminium Company Ltd. (NALCO), Bhubaneswar
3. Secretary, Department of Science & Technology (DST), Govt. of Odisha.

Note: For details on Kalinga Foundation Trust, the website www.kalingafoundationtrust.com may please be referred.

सत्यमेव जयते

प्रधान मंत्री

Prime Minister

Message

I am happy to learn that the prestigious UNESCO-Kalinga Prize for the popularisation of science is celebrating the 60th anniversary of its inception. The UNESCO-Kalinga Prize is a testimony to India's commitment to development through the power of science. The awardees of this prize who include well-known scientists and scholars from India and abroad, epitomize the intellectual achievements of all humanity.

I congratulate the organisers on hosting an international conference to celebrate the occasion. I hope the scientists, gathered at a common platform, will deliberate on how best to channelize scientific knowledge for peace and prosperity in the world.

Manmohan Singh

(Manmohan Singh)

New Delhi
15 December, 2011

Murlidhar C. Bhandare
GOVERNOR, ODISHA

December 31, 2011

MESSAGE

I am glad to know that Kalinga Foundation Trust, Bhubaneswar; UNESCO; Department of Science & Technology (DST), Government of India; Ministry of Human Resource Development, Government of India and Department of Science & Technology, Government of Odisha are jointly organizing an International Conference for celebration of 60th Anniversary of UNESCO Kalinga Prize for popularization of Science on January 4-5, 2012 alongside the 99th Indian Science Congress at Bhubaneswar. Besides a Commemorative Souvenir, a book entitled "UNESCO Kalinga Laureates for Universal Peace" containing life and works of all 66 UNESCO Kalinga Laureates is also being brought out commemorating the occasion.

Kalinga Prize instituted by the legendary statesman and former Chief Minister of Odisha late Shri Biju Patnaik through UNESCO in the year 1951 is indeed a great step towards promotion of scientific activities and technology for the benefit of people. The Prize signifies his commitment and far sighted vision for popularization of science. During 60 years many brilliant scientists across the world including several Nobel Laureates have been honoured with this coveted prize for their outstanding work. I am sure the assemblage of eminent scientists and their deliberations at the Conference will lead to significant breakthrough in the endeavours towards popularization and public understanding of science. The publications will also be highly enlightening.

I wish the occasion and publication all success.

Murlidhar Bhandare

(Murlidhar C. Bhandare)

RAJ BHAVAN, BHUBANESWAR 751008

NAVEEN PATNAIK
CHIEF MINISTER, ~~ORISSA~~ ODISHA

~~ORISSA~~ STATE ODISHA

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E. Mail–cmo @ ori nic in

D. O. No 892
BHUBANESWAR
Dated 30/12/2011

MESSAGE

I am glad to know that Kalinga Foundation Trust, Bhubaneswar ; UNESCO, Paris ; Department of Science & Technology, Government of India ; Ministry of Human Resources Development, Government of India and Science & Technology Department, Government of Odisha are jointly organizing an International Conference for celebration of the 60th Anniversary of UNESCO Kalinga prize for popularization of science at Bhubaneswar on 4th and 5th January, 2012.

It is a matter of great pride and prestige for Odisha that UNESCO Kalinga prize for the year 2011 will be conferred during the event in presence of most of the living UNESCO Kalinga laureates. The release of the book entitled "UNESCO Kalinga Laureates for Universal Peace" presenting the life and works of all the 65 UNESCO Kalinga Laureates during the occasion will be very enlightening for the seekers.

I wish the celebration all success.

(NAVEEN PATNAIK)

कपिल सिब्बल
KAPIL SIBAL

मंत्री
मानव संसाधन विकास,
संचार एवं सूचना प्रौद्योगिकी
भारत सरकार, नई दिल्ली -110 115
MINISTER OF
HUMAN RESOURCE DEVELOPMENT,
COMMUNICATIONS AND INFORMATION TECHNOLOGY
GOVERNMENT OF INDIA
NEW DELHI - 110 115

MESSAGE

Undoubtedly the march of human civilization has been due to the inexorable pace set by science and technology. The scientific advances have provided phenomenal understanding of our life systems, our ecosystem and our universe. Science has opened new vistas of knowledge, transforming human interaction and social structures. It has enabled instant communication anywhere on earth; the rate of transport of people, goods, finances and even environmental impact and diseases across nations has increased exponentially. Also despite the phenomenal progress of science the asymmetry in the distribution of wealth, of safety and of comfort has, in fact, increased in recent times; also the inequity within and among all nations has increased. Thus the benefits of science and technology have not significantly reached the majority of people living in the developing world. Thus, I feel that science popularization needs to highlight *interalia* a new social contract of science and society, conducive to establishing an egalitarian society. The Contract could reflect the commitment of individuals and groups of scientists and even the public to focus their own efforts to be maximally beneficial and helpful to society at large.

On the occasion of the 60th Anniversary of UNESCO Kalinga Prize for Popularization of Science, I extend my best wishes to the Kalinga Foundation Trust, United Nations Educational, Social and Cultural Organization (UNESCO), Department of Science and Technology, Government of India, Ministry of Human Resource Development, Government of India ad Science & Technology Department, Government of Odisha for organizing a very purposeful conference. I look forward to receiving a copy of the Souvenir and Conference proceedings.

Kapil Sibal

(KAPIL SIBAL)

Office : Room No. 302 'C' Wing, Shastri Bhawan, New Delhi - 110 115
Phone : 91-11-23387085, 23782387, 23782698, Fax No. : 91-11-23382365, 23782026

सत्यमेव जयते
डॉ. टी. रामसामी
सचिव
Dr. T. RAMASAMI
SECRETARY

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलाजी भवन, नया महरौली मार्ग, नई दिल्ली-110 016

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF SCIENCE & TECHNOLOGY
Technology Bhavan, New Mehrauli Road, New Delhi-110 016

MESSAGE

UNESCO-Kalinga Award for Popularization of Science has emerged as a recognition to important contributions making global impact. The Award has gained its value and esteem through the fame of the past awardees. Commemoration of the 60th Anniversary of the principle behind the institution of the award is both valuable and commendable.

Global perception of the role of science in socio-economic development has undergone significant changes. In modern world, public perception of science has enhanced. Science today includes also technology and innovation and no longer remains an 'Irony Toner' activity. Public understanding of science has become necessary.

UNESCO-Kalinga Award fulfills an important need namely global recognition of those who serve the society through popularization of science. My warmest greetings to the Kalinga Foundation and UNESCO on the 60th Anniversary of institution of the Prize.

I convey our thanks to all UNESCO-Kalinga Laureates for their outstanding work aimed at popularization of science and promotion of universal peace.

(T. Ramasami)

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Kalinga Bhawan, A/82/1, Nayapalli, Bhubaneswar-751 012, Tel.: (0674) 2394454

Foreword

The idea of compiling a Book on the Life and Works of "UNESCO Kalinga Laureates for Universal Peace" emerged in the year 2007 by Dr. (Mrs.) Shashi Ahuja, Director/Scientist-F, Department of Science &Technology(DST), Govt. of India during one of her visits to Kalinga Foundation Trust, Bhubaneswar, Odisha, India. Subsequently, the idea was culminated in to a Project Proposal and the same was submitted to DST, Govt. of India by Late Kamini Kanta Patnaik, the then Managing Trustee of Kalinga Foundation Trust. The Project Proposal was favourably considered by the Govt. of India and it was approved for implementation with an initial grant of Rs. 1 lakh for data collection, compilation & preparation of manuscript of the Book.

As we all know, Kalinga Prize , presently known as UNESCO Kalinga Prize from 2009 for Popularization of Science, is an international award created on an idea mooted by Late Biju Patnaik , Founder & Managing Trustee of Kalinga Foundation Trust in the year 1951 and was implemented by Kalinga Foundation Trust through UNESCO, Paris from the year 1952. So far 66 Eminent Scientists and Science Popularizers of the world from 23 countries, which include 7 Nobel Laureates, have been bestowed with the UNESCO Kalinga Prize which is considered as the most prestigious & coveted award of the world on Popularization of Science. Furthermore, it is a matter of great pride and prestige for Odisha that the UNESCO Kalinga Prize for Popularization of Science, which was instituted from the land of Kalinga, is the only International Prize from India & is considered as the highest award in the world under the category.

The Mission for compiling a Book, the first of its kind in the world, depicting the Life & Works of these Great Scientific Heroes of our times was really difficult and challenging. Kalinga Foundation Trust took up the responsibility of publishing the Book at Bhubaneswar with necessary financial support, cooperation and guidance of Department of Science & Technology, Govt. of India.

Kalinga Foundation Trust will remain grateful to Dr. V. S. Ramamurthy, the then Secretary, DST, Govt. of India, who initiated the proposal and presently Dr. T.Ramasami, Secretary, DST, Govt. of India for his active support, advice & guidance in publication of the Book and also to Dr. (Mrs.) Shashi Ahuja, Director, DST, Govt. of India for her time to

time guidance in compiling & editing the Book. Kalinga Foundation Trust will also remain grateful to Dr. T.K.Chandrashekar, Director, National Institute of Science Education & Research (NISER), Bhubaneswar and Chairman of the Organizing Committee for the International Conference for Celebration of 60th Anniversary of UNESCO Kalinga Prize for Popularization of Science in editing the Book.

Kalinga Foundation Trust and all its Trustee Members specially thank Late Kamini Kanta Patnaik , the then Managing Trustee of Kalinga Foundation Trust, who mooted the idea of such a Book and Sri Bimal Das, Secretary –cum- Treasurer for all the administrative job and coordinating the entire publication work. The gigantic task of collection of biographical information on these 66 UNESCO Kalinga Laureates took more than one year.

Kalinga Foundation Trust owes its highest appreciation to Dr. Chitta Ranjan Mishra, a Noted Scientist, Author and Science Popularizer, who is also a Trust Board Member of Kalinga Foundation Trust, for his hard work, profound dedication & untiring efforts in collection of data, compilation and editing of this gigantic Book containing Life & Works of all the 66 UNESCO Kalinga Laureates of the world from 23 countries. From his association and involvement in getting this Book published, it looks that his dream project has come true. Kalinga Foundation Trust also thanks his wife Prof. Dr. (Mrs.) Prasanna Rath and other associates who assisted Dr. Mishra in day to day compilation of this Book.

Kalinga Foundation Trust hopes that the Book will be a path finder for the next generation to take up science as a passion not only as a profession, which will help in transforming the face of the society .Science is the only weapon through which a new societal order can be established and popularizing science among the masses will give a new dimension in this endeavor.

Once again, Kalinga Foundation Trust compliments DST, Govt. of India particularly Dr.T.Ramasami, Secretary, DST, Govt. of India and Dr. (Mrs.) Shashi Ahuja, Director, DST, Govt. of India for their kind cooperation for publication of this Book.

Kalinga Foundation Trust also thanks Padmabhusan Prof. (Dr.) Trilochan Pradhan & Padmashree Prof (Dr.) P.K.Jena, former Jury Members of the then Kalinga Prize, for their guidance in bringing out the publication.

Kalinga Foundation Trust also thanks the Management of Guru Gouranga Press Trust, ISKCON, Bhubaneswar in typing the manuscript and printing the Book and also to Sri Akshaya Kumar Das of Ad Print, Bhubaneswar in designing the cover page.

(Bhabani Charan Pattanayak)
Chairman

UNESCO's International Prizes in Science

United Nations Educational Scientific and Cultural Origanisation (UNESCO)

International Partnership in Science

Unesco Kalinga Prize for the Popularization of Science

The Unesco Kalinga Prize for the Popularization of Science is an international distinction created by UNESCO in 1952 following a donation from Mr. Bijoyanand Patnaik(Biju Patnaik), Founder and President of the Kalinga Foundation Trust in India.

The recipient of this annual award must have distinguished him or herself during a brilliant career as writer, editor, lecturer, film producer radio/television programme director or presenter, through his/her talent in interpreting science and technology for the general public. The recipient should have striven during the course of his/her career to emphasize the international importance of science and technology and the contribution they make to improving public welfare, enriching the cultural heritage of nations and solving problems facing humanity. Many past Prize Winners have been scientists in their own right, while others have been trained in journalism or have been educators or writers.

Each Members State is entitled to nominate a single candidate, through its National Commission for UNESCO,on the recommendation of the national associations for the advancement of science or other science associations, or national associations of science writers or science journalists. Applications from individuals are not accepted.

The laureate is selected by the Director-General of UNESCO upon the recommendation of a four-member jury designated by him. Three members of the Jury from different countries of the world are designated on the basis of equitable geographical distribution and the fourth on the recommendation of the Kalinga Foundation Trust.

The Kalinga Prize is awarded during the Celebration of the World Science Day (2003, 2005, etc.) and in New Delhi, India, in even years. Under the terms of the Prize, the recipient receives the sum of 20,000 US$, a UNESCO Albert Einstein Silver Medal & a Citation. The recipient is also awarded the Kalinga Chair introduced by the Govt. of India to mark 50th Anniversary of UNESCO Kalinga Prize. As holder of Kalinga Chair, the Winner travels to India for a period of two to four weeks as the guest of the Govt. of India . The Chair also comprizes a token honorarium of USD 5,000. In the years when the award ceremony take place during the celebration of the World Science Day, the recipient travel to the city where the science day celebrate (2003 in Budapest) as the guest of UNESCO, in the years when it is awarded in New Delhi, the recipient is invited, as the guest of the Kalinga Foundation Trust, to undertake a brief lecture tour in India. For this reason, it is preferable that the recipient be proficient in English.

Who may apply :

- Writers, editors, lecturers, radio/television programme directors or film producers who have devoted their career to interpreting science, research and technology for the general public;
- the applicant does not need to have a science degree
- this prize does not reward research
- this prize does not reward formal teaching (in a school, university) nor curriculum development for the formal learning sector
- candidates are proposed by their Government through the National Commission for UNESCO.

- Each National Commission for UNESCO proposes a candidate on the recommendation of the national associations for the advancement of science or other science associations, or national associations of science writers or scientific journalists
- Each National Commission for UNESCO may propose a single candidature consisting of an individual only
- candidatures sent directly to UNESCO by individuals will not be accepted.

How to apply :

- do not apply directly to UNESCO; contact your National Commission for UNESCO to make known your interest in being your country's candidate for this prize;
- If you belong to a national association for the advancement of science or any other science or any other science association or to an association of science writers or scientific journalists, make known to it your interest in applying for this prize
- this was an annual prize till 2005. From 2006-2008, statute & financial guidelines were being revised. Since 2009, the prize is given bi-annually.
- checklist
- your application needs to contain the following items (in English or French in four copies)
  - Curriculum vitae
  - completed submission sheet (French/English)
  - description of your major achievements in science popularization
  - annexes supporting your career in science popularization. These may be books, CD-ROMs destined for the general public, newspaper articles, videocassettes of films or televivision programmes you have made, brochures of public exhibitions you have organized, etc.(Please note that if an official translation of your work into English and/or French does not exist, it is in your own best interests to supply a detailed explanation in English or French of the content of each annex or a partial translation).

The Kalinga Prize for the Popularization of Science is administered by the Science Analysis and Policies Division.

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International Partnership in Science

UNESCO Kalinga Prize for the Popularization of Science

Submission Form

This form is to be submitted to UNESCO solely by the National Commission for UNESCO in the candidate's home country

1 Name of the Member State submitting the candidature:

2. Name of the body proposing the candidature (if appropriate):

3. Candidate(s)' full name and nationality:
First name.....Last name:.....
Nationality:..... Birth Date:.....

4. Address:.....
.....
Town.....Country.....Postal Code.....

5. Contacts:
Telephone:..... Fax Number:.....
E-mail:..... WebSite:.....

6. List enclosed annexes (books, CD-ROMs, videocassettes, newspaper articles, etc.)

7. List translations/summaries of annexes in English and/or French (if originals in another language)

8. Description of the candidate's career in science popularization (use as many sheets as necessary):

The Statutes of the UNESCO Kalinga Prize for the Popularization of Science (NEW)

Article 1 : Purpose

The purpose of the prize is to reward the efforts of a person who has had a distinguished career as writer, editor, lecturer, ratio/television programme director or film producer, which has enabled him/her to help to interpret science, research and technology to the public. He/she is expected to have knowledge of the role of science, technology and general research in the improvement of public welfare, the enrichment of the cultural heritage of nations and the solutions to the problems of humanity. The objective of the Prize is in conformity with UNESCO's policies and is related to the programme of the Organization in the field of promoting public awareness in science.

Article 2 : Designation, amount and periodicity of the Prize

- The Prize shall be entitled “UNESCO Kalinga Prize for the Popularization of Science”.
- The Prize shall be funded by contribution of the Kalinga Foundation Trust, the Government of the state of Orissa, India and the Government of India (Department of Science and Technology) and shall consist of a recurrent payment of £14,000 sterling, which shall cover both the monetary value of the Prize, certificate, UNESCO Albert Einstein silver medal and the cost of administrating the Prize. Any interest that may accrue will be added to the overall contribution. The contribution of each donor is as follows: the Kalinga Foundation Trust, £4,000, the Orissa Government £4,000 and the Government of India £6,000.The donors should submit their contributions to UNESCO, under coordination of the Kalinga Foundation Trust, not later than 31 December of the year preceding the prize award.

  The Prize winner will be offered Kalinga Chair by Government of India (Department of Science and Technology) and will be invited to travel to India, for a two to four week period to interact with scientists and science communicators. He/she will be provided with appropriate facilities to familiarize him/herself with Indian life and culture, Indian research and educational institutions, and the development of India's industry and economy. The Chair also comprises a certificate and cash award of US$5,000. He/she will also be invited to visit Indian Universities and attend meetings of Indian scientific societies, particularly those of the Indian Science Congress Association. While in India, the recipient will be asked to deliver lecturers in English and take part in meetings, with a view to giving an interpretation to India of recent progress in science and technology or the social, cultural and educational consequences of modern science. Thus, he/she should preferably be proficient in English.
- All funds and the interest accrued thereon shall be kept in a special interest-bearing account of the Prize.
- The full staff support and operating management costs of the Prize, including all costs related to the award ceremony and public information activities, estimated at£4,000 shall be fully covered by donors. To this end, the Director-General will determine a mandatory overhead cost amount to be applied and charged against the funds in the special account, which is to be established under the financial regulations for the Prize.
- The Prize shall normally be awarded biennially in the same year of the UNESCO General Conference.

Article 3 : Conditions/Qualifications of candidates

Candidate shall have made a significant contribution to the popularisation of science. Prizes may be conferred only upon individuals.

Article 4 : Designation/Selection of prize-winner

The Prize winner shall be selected by the Director-General of UNESCO on the basis of the assessments and recommendations made to him/her by a jury.

Article 5 : Jury

- The Jury shall consist of five independent members, of different nationalities and gender, appointed by the Director-General for a period of six-years, eligible for re-election. One of the jury members having been recommended by the Kalinga Foundation Trust. The members of the Jury from different countries of the world shall be designated on the basis of equitable geographical distribution. Representatives and alternatives of Members of the Executive Board cannot be appointed as jurors. Jurors involved in a real or potential conflict of interest shall recuse themselves from further deliberations or be asked by the Director-General to do so. The Director-General may replace members of the Jury for reason.
- The Jury shall elect its own chair Members shall receive no remuneration for their work, but will receive reimbursement of any expenses linked with the evaluation process, up to a limit of US$500. A quorum of three jurors who submit their evaluation results will be required for jury deliberations to proceed. The working languages for deliberations by the Jury shall be English and French.
- The Jury shall adopt its own working procedures in conformity with these Statutes and shall be assisted in the performance of its task by a member of the UNESCO Secretariat designated by the Director-General. Decisions shall be taken by consensus to the extent possible and otherwise by secret ballot until a simple majority is obtained. A member shall not take part in a vote concerning a nomination from his or her country.
- The Jury need not physically meet. The correspondence among them could be ensured by airmail, facsimile, or electronic mail.
- The Jury shall send an assessment on nominations and accompanying recommendations to the Director- General of UNESCO no later than 31 August of the year of the Prize.

Article 6 : Nomination of candidates

- When UNESCO has received the funding of the Prize, as indicated in Article 2 above, the Director-General of UNESCO shall officially invite the submission of nominations to the Secretariat of the Prize, by 15 May of the year of the Prize, from the governments of Member States, in consultation with their National Commissions and non-governmental organizations maintaining formal relations [associate or consultative] with the Organization and active in relevant fields covered by the prize.
- Nomination shall be submitted to the Director- General by the governments of Member States, in consultation with their National Commissions, and by non- governmental organization maintaining formal relations with UNESCO.A self- nomination cannot be considered .Each Member State and non-governmental organization may designate one candidate.

- Each nomination shall be accompanied by a written recommendation, which shall include four copies of the following documents, in English or French:
    - Description of the candidate's background and achievements;
    - Summary of the work or the results of the work on popularization of science, publications and other supporting materials, submitted for consideration; and
    - Definition of the candidate's contribution of a review of the way in which the work submitted has contributed to the popularisation of science.

Article 7 : Procedure for the awarding of the Prize

- The Prize shall be awarded by the Director-General at an official ceremony held for that purpose in the place where UNESCO celebrates World Science Day, on 10 November. UNESCO shall present to the prize-winner a cheque for the amount of the prize £10,000, a certificate and the UNESCO-Albert Einstein silver medal. UNESCO shall officially announce the name of the prize-winner.
- The prize may be conferred only upon individuals. A work that has been produced by two or three persons shall not be considered.
- The prize-winner, if possible shall give a lecture on a subject relevant to the work for which the prize has been awarded.
- The work produced by a person since deceased shall not be considered for an award. If, however, a prize-winner dies before he/she has received the prize, then the prize may be presented posthumously to relatives or an institution.
- Should a prize-winner decline the prize, the Executive Board shall decide on the destination of the amount of the prize.

Article 8 : Sunset clause-mandatory renewal of the Prize

- After a period of six years, the Director-General of UNESCO together with the donors will undertake a review of all aspects of the Prize and decide about its continuation or termination. The Director-General will inform the Executive Board of UNESCO about the results of this review.
- In case of termination of the Prize, the use of any unspent balance of funds shall be determined by the Director-General, in accordance with the Financial Regulations of the Prize.

Article 9 : Appeals

No appeals shall be allowed against the decision of UNESCO with regard to the award of the Prize. Proposals received for the award of the Prize may not be divulged.

Article 10 : Amendments to the Statutes of the Prize

Any amendment to the present statutes shall be submitted to the Executive Board for approval

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Many Facets of Biju Patnaik

Founder of Kalinga Foundation Trust
&
UNESCO- Kalinga Prize for Popularization of Science

[Born : 5th March, 1916 Cuttack, Orissa, India
Died : 17th April,1997, New Delhi, India]

In my dream of the 21st century for the State. I would have young men and women who put the interest of the State before them. They will have pride in themselves, confidence, in themselves. They will not be at anybody's mercy, except their own selves. By their brain, intelligence and capacity, they will recapture the history of Kalinga. I would like my Orissa of the 21st centuary to have excellent artisans, Superb Craftsmen and sculptors, greatest musicians and poets".

... Biju Patnaik

"It is worth Writing about Biju Patnaik for atleast two reasons. His long life can be read as something of a history of India back to the time when the country was run by British. And he gave Indian Politics a rare fresh of colour".

.... The Economist

"Biju Patnaik is a Remarkable Indian whose adventures would fill a book."

..... Julian Huxley
UNESCO'S First Director General & Kalinga Prize Laureate - 1953

Biju Patnaik : An Illustrious Son of Orissa

Hemanta Kumar Nayak

Bijayananda Patnaik, popularly known as Biju Patnaik could become a legendary hero in his life time. He could prove that greatness does not descend to a man automatically, it is acquired by hard labour, perseverance and sacrifice. He distinguished himself as an Aeronautical Engineer, Navigator, Pilot, Industrialist, Freedom Fighter and above all a Statesman of National and International repute.

On 5th March, 1916, Orissa has given a great son to its soil by the parentage of Smt. Ashalata and Shri Lakshminarayan Patnaik at Cuttack. After receiving science education at Ravenshaw College, Cuttack, he entered into the Aeronautical Training Institute of India and Delhi Flying Club. Being an adventurous youth he captained University Team of hockey and football in his college career. He was trained to become a distinguished pilot and navigator. He joined Indian National Airways as an ace pilot and also served as the chief of the Air Transport Command in the years 1940-42.

Bijubabu joined the Quit India Movement in 1942 and became a leader of underground Congress Movement alongwith Jaya Prakash Narayan and Dr. Ram Manohar Lohia and underwent imprisonment during 1942-45. During his participation in the Indian Freedom Struggle Biju Patnaik came in contact with Pandit Jawaharlal Nehru and became his trusted friend. He maintained contact with Nehru and consulted him whenever required. He was also instrumental in signing the Linggadjti Agreement on 25th March, 1947 which brought an end to the Dutch rule in Indonesia. Pt. Nehru entrusted the task to Biju Patnaik to create international public opinion against the Dutch and also persuade the friendly countries to raise the issue before the U.N.O. Biju Patnaik sprang up to instant action. He braved all hazards and rendered his best of service to the people of Indonesia at their crucial hour of need. He flew to Java and brought Sultan Sjahrir aboard from Java islands on 22nd July, 1947 by his own Dacota and reached India via Singapore on 24th July. It is reported that his wife Mrs. Gyan Patnaik also accompanied him in this perilous mission. This noble and heroic deed of Biju Patnaik was duly recognized by the Indonesian Government for his act of bravery at such crucial and critical juncture. He was awarded "BHOOMI PUTRA", the highest Indonesian award and a rare distinction ever granted to a foreigner.

Biju Patnaik also played a very significant role in the historic Jammu & Kasmir operation in 1947. At such critical juncture there appeared Biju, infuriated, yet committed to the cause of the nation. The prestige of motherland was his prime consideration rather than any thing else. He always took up the task as a challenge and his efforts were successful. He was able to land the first platoon of troops at Srinagar Airport on 27th October, 1947 at 10.00 a.m.

Bijubabu became the Chief Minister of Orissa in 1961 and Union Cabinet Minister for Steel and Mines from 1977 to 1979 and Union Minister for Steel, Mines and Coal from July, 1979 to January, 1980. He was the member of the Lok Sabha from 1980-85. He became the Leader of the Opposition in the Orisa Legislative Assembly from 1985-89 and was sworn in as Chief Minister of Orisa for the second time on 5th March, 1990.

"International Kalinga Award" is the contribution of Late Biju Patnaik. He has instituted this Prize for the popularization of science among the common people, which is monitored by UNESCO. Bijubabu was quite conscious of holding the banner of Kalinga high. He

named his airlines as Kalinga Airlines and all his industrial establishments are named after Kalinga. People of Orissa are really proud of Biju Patnaik for his endeavour to organize a voyage to the Indonesian island of Bali to commemorate the glorious sea-fare tradition of the people of Kalinga.

The people of Orissa mourned his death most grievously. The mortal becomes immortal for his undying legacy and he still lives in renewed vigour in the hearts of millions of people of his state as well as his country. Biju Patnaik departed of 17th April, 1997 in New Delhi and the normal activities stalled due to break down of the emotion of Oriya people in Orissa. Lakhs of people rushed spontaneously to take part in the funeral procession jamming the entire 59 km road from Bhubaneswar to Puri. That shows the greatness of a man, an illustrious son of Utkal Janani.

Source :

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A Brief History of Kalinga Foundation Trust Bhubaneswar, Odisha, India

Kalinga Foundation Trust (KFT) was founded by the Legendary Late Sri Biju Patnaik, Hon'ble former Chief Minister of Odisha and former Union Minister, Govt. of India. The innovative idea of extracting petrol from coal was the brain child of Sri Patnaik and he implemented this project through KFT by sending six bright meritorious young Indian students to Paris for research on the subject. The objectives of this society are Public Charitable & Literary, viz: to diffuse useful knowledge in arts, science, scientific research, engineering, technology and promotion of literature, political education and allied subjects both inside and outside the Indian Union; To organize relief works in times of flood, famine, earthquake, cyclone, fire, tempest, epidemic & such other calamities; To promote, encourage foreign studies and researches by Indian students; To provide medical and welfare facilities and other amenities to children, disabled and infirm persons, the destitute and the orphans; To make arrangements for poor and deserving persons for free medical treatments and to provide stipends, scholarships, grants for enabling meritorious and deserving students to prosecute higher studies in India or abroad etc. All the above objects are being implemented by KFT for the last sixty years.

For details, the Website of Kalinga Foundation Trust (www. kalingafoundationtrust.com) may please be referred.

UNESCO PRESS

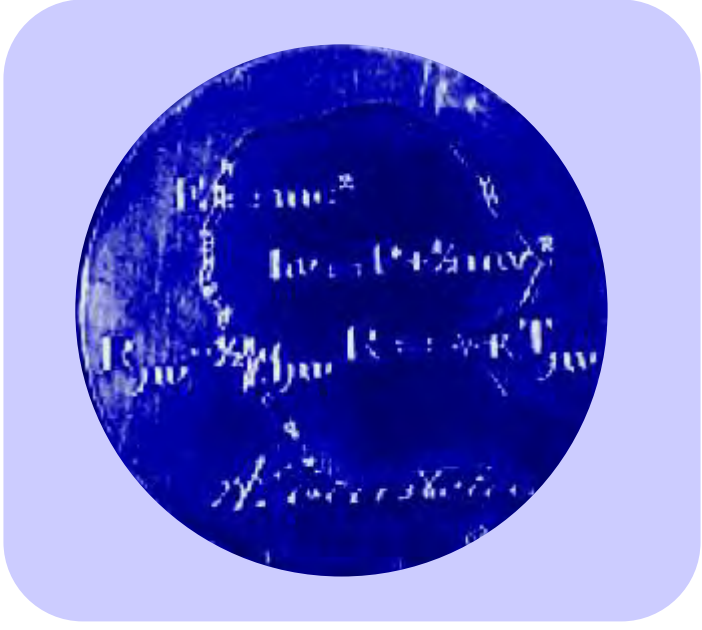
An Asteroid Named "Kalinga"

New Delhi, 27 September- On the occasion of 50th anniversary of the establishment of the Kalinga Prize, the International Astronomical Union through its commission of Minor Planet Nomenclature has decided to name minor planet (i.e. asteroid) no. 26214 "Kalinga".

The asteroid was discovered in 1997 by the Czech astronomer Dr. Petr Pravec from the Ondrejov Observatory of the Czech Academy of Sciences. The total number of asteroids discovered from Ondrejov is 152.

Kalinga is at a distance of 2, 946 Astronomical Units (AU) from the earth. An AU is equivalent to 149,597,871 kilometres.

Front View of Einstein's Silver Medal



Back View of Einstein's Silver Medal

Glories of Kalinga


KALINGA
FOUNDATION TRUST

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Kalinga Laureate for Popularization of Science - 1952

Dr. Louis De Broglie, France

Discoverer of the Wave Nature of Particles

[Born : 15th August 1892
Died : 19th March, 1987]

"Having much more the state of mind of a pure theoretician than that of experimenter or engineer, loving especially the general and philosophical view, I was drawn towards the problems of atomic physics... It was the conceptual difficulties which these problems raised; it was the mystery which surrounded that famous Planck's constant, h, which measures the quantum of action; it was the disturbing and badly-defined character of the dualism of waves and corpuscles, which appeared to assert itself more and more in the realms of physics..."

Louis de Broglie

Louis de Broglie

[15.08.1892 - 19.03.1987]

Discoverer of the Wave Nature of Particles

[World's First UNESCO Kalinga Laureate in 1952]

Biographical Sketch :

Prince Louis-Victor-Pierre-Raymond, 7th duc de Broglie, generally known as Louis de Broglie, is best known for his research on quantum theory and for his discovery of wave nature of electrons. He was awarded the 1929 Nobel Prize for Physics "for his discovery of the wave nature of electrons." The wave-like behaviour of particles discovered by de Broglie, was used by Erwin Schrodinger in his formulation of wave mechanics.

Louis de Broglie was born in Dieppe (Seine-Maritime), France on August 15, 1892. He was the younger son of Victor, 5th duc de Broglie. His mother was Pauline d' Armaille. The de Broglie family is one of the most illustrious families of France. De Broglies came to serve the French kings in the seventeenth century. The family came from Piedmont, then in France and now in Italy. In 1740 Louis XIV had conferred on the head of the family the hereditary title of duc (duke). The German title Prinz (Prince) dated in the family from service to the Austrians during Seven Years War (1756-63). The de Broglies achieved high distinctions as politicians, diplomats and soldiers. Four members of Broglies became Marshals of France. The French Revolution was a difficult and trying time for de Broglie family and at least one de Broglie died at the guillotine. The family remained prominent in French public life throughout the nineteenth century.

De Broglie was exceptionally charming in his childhood. His elder sister wrote : "This little brother had become a charming child, slender, svelte, with small laughing face, eyes full of mischief, curled like a poodle. Admitted to the great table, he wore in the evenings a costume of blue velvet, with breeches, black stockings and shoes with buckles, which made him look like a little prince in a fairy tale. His gaiety filled the house. He talked all the time even at the dinner table where the most severe injunctions of silence could not make him hold his tongue, so irresistible were his remarks. Raised in relative loneliness he had read much and lived in the unreal.... he had a prodigious memory and knew by heart entire scenes from the classical theatre that he recited with inexhaustible verve..... he seemed to have a particular taste for history, in particular political history.....hearing our parents discuss politics he improvised speeches inspired by the accounts in the newspapers and could recite unerringly complete lists of ministers of the Third Republic, which changed so often.... a great future as a statesman was predicted for Louis."

De Broglie was educated at home by private tutors. In 1906, his father died. His elder brother Maurice, then at 31, took charge of his upbringing. It was at Maurice's advice he was sent to Lycee Janson de Sailly, where he spent three years before completing his secondary school education in 1909. Maurice wrote : "Having experienced myself the inconvenience of a pressure exercised on the studies of a young man I refrained from imparting a rigid direction to the studies of my brother, although at times his vacillation gave me some concern. He was good at French, history, physics, philosophy, indifferent in mathematics, chemistry and geography, poor in drawing and foreign language."

On completion of school education, de Broglie joined the University of Sorbonne. At the time of joining the university, he had no definite plan

for a career. He was not attracted to the idea of a military or diplomatic career. At the beginning he studied history but he did not like the uncritical way the history was taught those days. From history he shifted to law with a view to make a career in the civil service. At the age of 18 he graduated with an arts degree. He was then assigned a research topic in history of his choice. But he did not complete his research in history. Instead he decided to study theoretical physics, a subject he chose to devote his life to. In deciding to study physics he was greatly influenced by Poincare's masterworks, La valeur de la science and La science et I'hypothese. In choosing theoretical physics as a career, he was also influenced by his elder brother Maurice, who was also a physicist and made notable contributions to the experimental study of the atomic nucleus. Maurice kept a well-equipped laboratory at the family mansion in Paris. However, his journey in theoretical physics was not very smooth. In those days at the Sorbonne University the teaching of physics did not include the recent developments in the subject like Maxwell's electromagnetic theory of statistical thermodynamics. The course was based on standard subject like mechanics and wave optics. Books on these topics were also not available in French. French translations of foreign textbooks were often of poor quality. De Broglie made it a point to attend Poincare's lectures on electrodynamics, thermodynamics, celestial mechanics and other subjects. In his initial years he passed through emotional and psychological problems. Apparently this was triggered by the marriage of his elder sister Princess Pauline, to him he was deeply attached. Princess Pauline was 20 years older than de Broglie. After her marriage de Broglie lost her youthful personality full of gaiety and spirits. He lost an examination in general physics. Following these developments when his self-confidence at its lowest, he chanced upon reading the report of the first Solvay Conference on quantum theory. At the end of reading this report in depth he was confident that theoretical physics would be his career. In 1913 de Broglie obtained a science degree.

After attaining the required age, he had to join the military service as it was mandatory for everyone in France. He had to stay in army for six years as the First World War broke out. Initially he was sent to the fort at Mont Valerien, where he had nothing much to do and it was a very difficult situation for him. However, his brother exerting his influences got him transferred to the radiotelegraphy section situated at the bottom of the Eiffel Tower, on which a radio transmitter had been installed. De Broglie served as telegraph operator. Commenting on his war-time work de Broglie later commented that he "was able to serve his country while working as an electrician, taking care of machines and wireless transmission and perfecting heterodyne amplifiers then in their infancy." De Broglie later admitted that the practical experience gained during the war time helped him in his scientific research. After the war was over, de Broglie resumed his studies of physics with his elder brother, Maurice, who worked on experimental physics in his well-equipped laboratory in the family mansion in Paris. Unlike his brother, de Broglie was interested in the theoretical aspect of physics. Immediately after he was decommissioned from the army, the attended a seminar given by Langevin on quantum theory and then a course on relativity. De Broglie wrote : "...demobilized in 1919 I returned to the studies I had given up, while following closely the work pursued by my brother in his private laboratory with his young collaborators on X-ray spectra and on the photoelectric effect. Thus I made my first steps towards research by publishing a few results in the fields studied by my brother.

In a first series of publications I considered the adsorption of X-rays, its interpretation by the theory of Bohr, and its relation with thermodynamic equilibrium...some of the reasonings I used were questionable but they led me to formulae which gave an acceptable account of the facts. At the

same time I had long discussions with my brother on reinterpretation of the beautiful experiments that he pursued on the photoelectric effect and corpuscular spectra. I published, with him or separately, a series of notes on the quantum theory of these phenomena which, although classical now, was not well established then."

In 1923 de Broglie brilliantly brought together the concepts of the particle and the wave. He was influenced by Einstein's work on particle nature of light. De Broglie wrote : "After long reflection in solitude and meditation, I suddenly had the idea, during the year 1923, that the discovery made by Einstein in 1905 should be generalized by extending it to all material particles and notably to electrons." At the beginning of the twentieth century physicists explained physical phenomena in terms of particles like electrons or protons and electromagnetic radiation like light, ultraviolet radiation etc. While particles were visualized as discrete entities forming atoms and molecules but electromagnetic radiation were conceived as a wave motion involving changing electric and magnetic fields. This conventional visualization of the physical world was changed by Einstein's work. The special theory of relativity founded by Einstein showed that matter itself was a form of energy. While explaining the photoelectric effect, Einstein proposed that electromagnetic radiation, a wave, can also behave as particle (photon).

De Broglie, influenced by Einstein's work, proposed that just as waves can behave as particles, for instance electrons, can also behave as it were a wave motion (a de Broglie wave) with wavelength h/p, where p is the momentum of the electron and h is Planck's constant. He summed up his discovery in the following words : "Because the photon, which, as everyone knows, is a wave, is also a particle, why should not the electron (or any material particle) also be a wave ?" His revolutionary idea was put forward in his doctoral thesis of 1924, entitled Recherches sur la theorie des quanta (Research on Quantum Theory). It contained the idea of matter waves. The thesis was published as a paper of over 100 pages in Annales der Physique in 1925. Today it may seem to be very logical to think that way but for de Broglie it was a daring act. This was rightly taken note of by the Nobel Committee. In its citation noted. "When quite young, you threw yourself into the controversy raging over the most profound problem in physics. You had the boldness to assert, without the support of any evidence whatsoever, that matter had not only a corpuscular nature but also a wave nature. Experiments came later and established the correctness of your view."

The idea which later proved to be of far-reaching implications was taken very seriously by many scientists. Ralph Fowler reported de Broglie's discovery to the British scientific journals and Langevin apprised Einstein of the development, who in turn reported it to Berlin Academy of Sciences. These developments ensured rapid spread of the "bizarre" ideas of de Broglie, till then an obscure theoretical physicist and mostly known to the scientific community as "Maurice's younger brother." Einstein was very sympathetic to de Broglie's idea. He wrote to Langevin : "Louis de Broglie's work has greatly impressed me. He has lifted a corner of the great veil. In my work I obtain results which seem to confirm his. If you see him please tell how much esteem and sympathy I have for him."

The experimental verification of de Broglie's discovery of wave nature of particles became feasible after Walter Elsasser, a graduate student at the University of Gottingen, suggested that like X-rays, electrons could be diffracted by a crystals. Compared to the spacings between atomic layers in crystal; the wavelengths of de Broglie's waves corresponding to high speed electrons were shorter. Thus for de Broglie's waves, a crystal lattice would serve as a three-dimensional diffraction gratings and sharp peaks in the intensity of the diffracted beams should occur at specific angles. This was actually experimentally verified in

1927 by Clinton Davisson and Lester Germer at the Bell Labs in New York City and by George Paget Thomson at the University of Aberdeen, Scotland.

The fact that particles can behave as waves and radiations (waves) can behave as particles is called wave-particle duality. This has caused intense debate as to the "real" nature of particles and electromagnetic radiations — whether there is determinacy in quantum mechanics. De Broglie himself believed that there is true determinable physical process underlying quantum mechanics and that the current indeterminate approach in terms of probability can be replaced by a more fundamental theory.

After receiving his PhD degree of the Sorbonne University in 1942 de Broglie completed two years' free lectures at the Sorbonne University before he was appointed Professor of Theoretical Physics at the Henri Poincare Institute, which had just been built in Paris with the purpose of teaching and developing theoretical physics. In 1932, he was appointed to the chair of theoretical physics at the Faculty of Sciences of the Sorbonne University, where he taught till 1962. Joan James, in his "Remarkable Physicists : From Galileo to Yukawa," wrote : "For thirty-three years duc Louis lectured at the Sorbonne. He took a very exalted view of his duties as a teacher, the books that originated from his lectures, beautifully written and carefully produced, brought instruction and enlightenment. In his teaching he took great care when presenting his own ideas to explain that they were not generally accepted. However, as a lecturer in the classroom he was uninspiring. Starting scrupulously on time, he read in his highpitched voice and in a somewhat monotonous tone from abruptly at the end of the hour and departed immediately. He also ran a well-attended weekly seminar at which young and not so young theorists could expound their ideas." Many students from France and other countries came to work with him and a large number of PhD theses were prepared under his guidance.

Recalling the origins of his discovery, de Broglie in a lecture delivered in 1945 said : "Thirty years ago, physics was divided into two camps... physics of matter, based on the concepts of particles and atoms which were supposed to obey the laws of classical Newtonian mechanics, and the physics of radiation, based on the idea of wave propagation in a hypothetical continuous medium, the luminous and electromagnetic ether. But these two systems of physics could not remain detached from each other : they had to be united by the formation of a theory of exchanges of energy between matter and radiation....the intervention of quanta and of Planck's constant h, as much in the theory of photons as in that of the quantization of the electronic movements, seemed to me to show clearly that the link between the two terms of the wave-corpuscle dualism took place through the intermediary of the quantum of action, and must in consequence be expressed mathematically for formulae in which the constant h would appear. This was already the case for the relations which, in the theory of the photon, expressed the energy and momentum of the corpuscle of light as a function of the frequency and of wavelength of the luminous wave, and the form of these relations gave an indication of the interaction that had to be established in the general case of any corpuscle whatever.... Thus I arrived at the following general idea which has guided my researches; for matter, just as much as for radiation, in particular light, we must introduce at one and the same time the corpuscle concept and the wave concept. In other words, in both cases we must assume the existence of corpuscle accompanied by waves. But corpuscles and waves cannot be independent, since, according to Bohr, they were complementary to each other; consequently it must be possible to establish a certain parallelism between the motion of a corpuscle and the propagation of the wave which is associated with it."

After his path-breaking discovery de Broglie's

work chiefly devoted to various extensions of wave mechanics—Dirac's theory of the electron, the new theory of light, Uhlenbeck's theory of spin, applications of wave mechanics to nuclear physics, etc. Towards the later part of his scientific career de Broglie worked towards developing a causal explanation of wave mechanics, in opposition to the wholly probabilistic models which dominate quantum theory but he had to abandon it in the face of severe criticism of fellow scientists.

It was Louis de Broglie, who in 1949 at the Lausanne European Cultural Conference, issued the first high level call for establishing multinational laboratory as an instrument to revive European research. He was joined by Raoul Dautry, administrator general of the French Atomic Energy Commission; Pierre Augur, Director of UNESCO's Department of Exact and Natural Sciences (1948-1959); and Edoardo Amald, one of the founders of Italy's National Institute for Nuclear Physics. This led to establishment of the European Organisation for Nuclear Research (CERN).

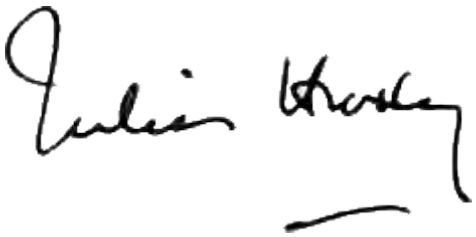
In 1933, de Broglie was elected a member of the French Academy of Sciences. He became a permanent Secretary of the Academy at the age of fifty, a post he held till he resigned at the age of 83. But he continued to be associated with the Academy in an honorary capacity till his death. The Academy awarded him its Henri Poincare Medal in 1929 and the Albert I of Monaco Prize in 1932. The French National Scientific Research Centre awarded him its gold medal in 1956. Among other awards received by him included Grand Cross of the Legion d'Honneur of France and Officer of the Order of Leopold of Belgium. He was among the few scientists to be elected to the literary Academy of France. He was elected a foreign associate of the US National Academy of Sciences in Washington and a foreign member of the Royal Society of London. In 1960 upon the death without heir of his elder brother, Maurice, 6th duc de Broglie, Louis de Broglie became the 7th duc de Broglie.

De Broglie published more than 25 books on various subjects of physics. Some of his important publications are : Waves and Motions (1926), Wave Mechanics (1928), Non-linear Wave Mechanics : A Causal Interpretation (1960), Introduction to the Vigier Theory of Elementary Particles (1963), and The Current Interpretation of Wave Mechanics : A Critical Study (1964). In addition to his strictly scientific work De Broglie wrote on popular aspects of physics, and philosophy of science including the value of modern scientific discoveries. Among his popular books on physics included Matter and Light : The New Physics (1939); The Revolution in Physics (1953), Physics and Microphysics (1960) and New Perspectives in Physics (1962). **In 1952, de Broglie was awarded the first Kalinga Prize by UNESCO for his efforts to explain modern physics to laymen.**

Louis de Broglie died on March 19, 1987 in Louveciennes (Yvelines).

Kalinga Laureate for Popularization of Science - 1953

Sir Julian Sorell Huxley, FRS
United Kingdom



[Born : 22th June, 1887
Died : 14th February, 1975]

If I am to be remembered, I hope it will not be primarily for my specialized scientific work, but as a generalist; one to whom, enlarging Terence's words, nothing human and nothing in external nature was alien.

Julian Sorell Huxley, Memories (Autobiography), 1970.

SIR JULIAN SORELL HUXLEY, FRS

Sir Julian Sorell Huxley, *FRS (June 22, 1887- Febryary 14, 1975) was a British biologist, author, humanist and internationalist, known for his popularisations of science in books and lectures. He taught at the Rice Institute, Houston, Tex. (1912-16), at Oxford (1919-25), and King's College, London (1925-35). Secretary (1935-42) of the Zoological Society of London. From 1946 to 1948 he served as the first director-general of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and was knighted in 1958.*

Huxley was part of a distinguished family. His brother was the writer Aldous Huxley, and half-brother a fellow biologist and Nobel laureate, Andrew Huxley; his father was writer and editor Leonard Huxley; and his paternal grandfather was biologist Thomas Henry Huxley, famous as a colleague and supporter of Charles Darwin. His maternal grandfather was the academic Tom Arnold, and great-grandfather Thomas Arnold of Rugby School.

Early life :

Huxley was born on June 22, 1887, at the London house of his aunt, the novelist Mary Augusta Ward, while his father was attending the jubilee celebrations of Queen regnant Victoria of the United Kingdom. Huxley grew up at the family home in Surrey, where he showed an early interest in nature as he was given lessons by his grandfather. At the age of thirteen Huxley attended Eton College, and continued to develop scientific interests in the school laboritories that his grandfather had compelled the school to build several decades earlier. At Eton he developed an interest in ornithology and in 1905 obtained a scholarship in Zoology at Balliol College, Oxford.

Academic life :

In 1906, after a summer in Germany, Huxley took his place at Oxford, where he developed a particular interest in embryology and protozoa. In the autumn term of his final year, 1908, his mother died from cancer. In 1909 he graduated with first class honours, and was offered the Naples scholarship. He spent a year at the Naples Marine Biological Station where he developed his interest in embryology and development by researching sea squirts and sea urchins. In 1910 he took up a lecturing post at Oxford, but in 1912 was asked by Edgar Odell Lovett to take the chair of Biology at the newly created Rice Institute in Houston, Texas, which he accepted and took up the following year.

Before taking up the post at the Rice Institute, Huxley spent a year in Germany preparing for his demanding new job. Working in a laboratory just months before the outbreak of World War-I, Huxley overheard fellow academics comment on a passing aircraft, "it will not be long before those planes are flying over England," cementing Huxley's strong internationalist political views. While in Germany Huxley experienced a nervous breakdown and returned to England to rest in a nursing home. At the same time his brother Trev, two years junior, also had a breakdown, and hanged himself.

In September 1916 Huxley returned from Taxas to assist in the war effort, working in

intelligence, first at GCHQ and then in northen Italy. After the war he was offered a fellowship at New College, Oxford, which had lost many staff and students in the war. In 1925 Huxley moved to King's College London, as Professor of Zoology, but in 1927 left teaching and research to work full time with H.G. and G.P Wells on *The Science of Life* (see below).

In 1935 Huxley was appointed secretary to the Zoological Society of London, and spent much of the next seven years running the society and its zoological gardens, London Zoo and Whipsnade Park, alongside his zoological research. In 1941 Huxley was invited to the United States on a lecturing tour, and generated some controversy after stating that he believed the United States should join World War-II a few weeks before the attack on Pearl Harbor. Because of the country's joining the war his lecture tour was extended and the council of the Zoological Society, who were uneasy with their secretary, used this as an excuse to remove him from his post. Huxley seized this opportunity to dedicate much of the rest of his life to science popularisation and political issues.

As well as his zoological research Huxley contributed theorectical works to evolutionary biology, and he was one of the many key people in the modern evolutionary synthesis. Bird watching in childhood gave Huxley his interest in ornithology, and throughout his life he helped devise systems for the surveying and conservation of birds; and wrote several papers on avian ethology. His research interests also included medicine and the then infant field of molecular biology. He was a friend and mentor of the biologist Konrad Lorenz.

Huxley coined the terms "mentifacts", "socifacts" and "artifacts" to describe how cultural traits take on a life of their own, spanning over generations. This idea is related to memetics.

UNESCO :

In the 1930s Huxley visited Kenya and other East African countries to see the conservation work, including creation of national parks, which was happening in the few areas that remained uninhabited due to malaria. He was later asked by the British government to survey the West African commonwealth countries for suitable locations for the creation of Universities. On these trips Huxley developed a concern of education and conservation throughout the world, and was therefore involved in the creation of the United Nations Educational, Scientific and Cultural Organization (UNESCO), and became the organization's first Director-General in 1946.

Huxley's internationalist and conservation interests also led him to set up the World Wildlife Fund.

Humanism :

Less well known is the fact that Huxley, a Humanist was also the first president of the Internationalist Humanist and Ethical Union, and served with John Dewey, Albert Einstein and Thomas Mann on the founding advisory board of the First Humanist Society of New York.

Eugenics :

Like many biologists in the first half of the twentieth century, Huxley was a proponent of Eugenics as a method of bettering society. Huxley wrote two books critical of genetics in the Soviet Union (which he twice visited), which was dominated by Lysenkoism, a pseudoscientific doctrine which states that acquired characteristics can be inherited. Lysenkoism was dangerous because it stopped the artificial selection of crops on Darwinian principles, which eventually led to famine. Huxley feared a similar process of genetic stagnation would occur in the human population without the aid of eugenics, which the Lysenkoists rejected.

While Huxley saw eugenics as important for removing undesirable variants from the human gene pool as a whole, he believed that races were equal, and was an outspoken critic of the eugenic

extremism that arose in the 1930s. Huxley was a critic of the use of race as a scientific concept, and in response to the rise of fascism in Europe was asked to write *We Europeans.* The book, on which he collaborated with the ethnologist A.C. Haddon, sociologist Alexander Carr-Saunders and Charles Singer, which amongst other things suggested the word race be replaced with ethnic group. Following the Second World War he was instrumental in producing the UNESCO statement on race, which asserted that race is a cultural concept and not a scientific one. In particular the UNESCO statement helped destroy the idea that Jewish people form a distinct racial group-a key plank in Nazi and other ideologies that led to the Holocaust.

In the post war years, following the horrific results of the abuse of eugenics, Huxley (1957) coined the term "transhumanism" to describe the view that man should better himself through science and technology, possibly including eugenics, but more importantly the improvement of the social environment.

Public life and Science Popularisation :

Huxley discovered the lucrative business of popular science writing after publishing articles in newspapers. In the late 1920s he was introduced to book writing when asked to collaborate on two projects, a textbook of animal biology with his Oxford colleague J.B.S. Haldane, and by H.G. Wells on a definitive nine-volume set of popular science books on biology, *The Science of Life.* Other notable publications include *Essays of a Biologist* and *Evolution : The Modern Synthesis.*

In 1934 Huxley collaborated with Alexander Korda to create the world's first natural history documentary, *The Private Life of the Gannet,* on the Pembrokeshire coast, for which they won an Oscar for best documentary.

In later life, he became known to an even wider audience through television and radio appearances. In 1939 the BBC asked him to be a regular pannelist on a Home Service general knowledge show, *The Brains Trust,* in which he and other panelists were asked to discuss questions submitted by listeners. The show was commissioned to keep up war time morale, by preventing the war from "disrupting the normal discussion of interesting ideas". He was a regular panellist on one of the BBC's first quiz shows, *Animal, Vegetable, Mineral ?,* in 1955.

In his essay "The Crowded World" published in *Evolutionary Humanism* (1964), Huxley was openly critical of Communist and Catholic attitudes to birth control, population control and overpopulation. Based on variable rates of compound interest, Huxley predicted a probable world population of 6 billion by 2000. The United Nations Population Fund marked 12th October 1999 as **The Day Of 6 Billion.**

Huxley had a close association with the British rationalist and humanist movements. He was an Honorary Associate of the Rationalist Press Association from 1927 until his death, and on the formation of the British Humanist Association in 1963 became its first President, to be succeeded by AJ Ayer in 1965. He was also the first President of the International Humanist and Ethical Union. Many of Huxley's books address humanist themes.

The Vision of Julian Huxley :

Huxley was a far more innovative thinker than is generally recognized today, even by humanists. Although he was one of the foremost biologists of his time, his most important contributions had to do not primarily with genetic evolution but with that of culture, and with the interrelationships between the two processes. Today we are accustomed to the concept of interactive, feedback systems; and to scientists at the forefront of physics, engineering, neuro-and cognitive-psychology and evolutionary theory conceptualizing their theories in terms of these. But few of the people concerned are aware that it was Julian Huxley who laid much of the groundwork for this type of thinking. He did this by spelling out the critical evolutionary role of "emergence" : The process by which an

accumulation of quantitative changes could somehow set the stage for the triggering of seemingly qualitative transition in the nature of patterns of interaction.

Huxley was perhaps the first evolutionary theorist to recognize the reality and causal significance of human society and culture : a reality which materialism - by the very nature of its premises - is forced to ignore. He concluded 'that in the future it would be cultural factors, rather than biological, which would determine the direction for evolution.

As for Huxley's belief that evolution is progressive in nature, he did employ the concept, but in a carefully defined and limited way.

Huxley was maintaining that humankind must attempt to achieve a unity of knowledge. According to him, the only potentially universal type of knowledge is scientific, in the broad sense of resting on verified observation or experiment, it follows that this unity of knowledge will only be attained by the abandonment of non-scientific methods of systematizing experience, such as mythology, superstition, magico-religious and purely intuitional formulations. He then went on to list the most important ideas on which the unified system must be based. These were : (1) the unity of nature, as opposed to all forms of dualism; (2) all nature as process, to be explained by evolution rather than any static mechanism; (3) evolution as directional, but only in the sense that it generates greater variety, complexity and specificity of organization - even though this may often lead into dead-ends; (4) evolutionary advance as defined in terms of the realization of new possibilities in nature; and (5) an evolutionary view of human destiny, with humankind recognized as the chief instrument of further evolution, as against all theological, magical, fatalistic or hedonistic views of destiny.

Julian Huxley, A Theistic Religionist :

Julian Sorell Huxley (1887-1975) had a distinguished ancestry. His paternal grandfather was the Darwinian Thomas Henry Huxley (1825-1895); his maternal great grandfather was Thomas Arnold (1795-1842), headmaster of Rugby. His father Leonard, was a classics master of Somervifle College, Oxford, founded a girls' school at Godalming in 1902.

After schooling by a governess until the age of ten, he became a day-pupil in the Hillside Preparatory School, London where he found delight in natural history. At thirteen he developed a lifelong interest in bird watching, particularly upon entering Eton with a scholarship, where he started a bird watching diary. At eighteen, he received a scholarship in zoology at Balliol College, Oxford. After reading about the life of Pasteur, he was inspired by the scientific method. When he was twenty-one he won the Newgate Prize in poetry but used the award to purchase a microscope. The following year he obtained a B.A. with a first class in zoology : since that year also marked the Darwinian semicentennial, he resolved to continue his own studies in the Darwinian spirit. He received a one-year scholarship at the Naples Biok*cal Station, where he investigated sponges. His results were published in the Royal Society's *Philosophical Transactions.* In 1912 he was appointed - Assistant Professor and Chairman of the Biology Department of the new Rice Institute in Houston, Texas. Four year later, he returned to England during World War I.

After serving in the Army Service Corps and then in Intelligence, Huxley was made a Fellow of New College, Oxford and Senioi Zoology Demonstrator. He married a Swiss governess, Juliette Bailor. A year later, he joined the Oxford Expedition to Spitsbergen; he always enjoyed mountaineering. In 1925 he was made Professor of Zoology at King's College, London, and the next year was given a three-year appointment as Fullerian Professor at the Royal Institution. At forty, together with H.G. Wells and his son C.P. Wells, he published the *Science of Life.* In 1927 he resigned from King's but retained an honorary lectureship there.

As a member of the Colonial Office Committee on Education, he went to East Africa in 1929 to survey the biological education and nature conservation there. Subsequently, he made a number of lecture tours in the U.S. and received an Oscar for his documentary film, "The Private Life of the Gannets". At forty-eight he accepted the Secretaryship of the London Zoological Society. In 1939, with Professor C.E.M. Joad, *et alia,* he conducted the Brians Trust program for the British Broadcasting Company (BBC) on "Scientific Research and Social Needs," thus becoming a national figure.

In 1944, he visited West Africa for the Commission on Higher Education in the Colonies. The following year he attended the bicentennial of the Russian Academy of Science, where he heard a lecture by the quack geneticist Lysenko. He served on the Hobhouse Committee on National Parks. In 1945 he was appointed Secretary and then elected Director General of the new UNESCO (replacing the proposed UNECO) for a two-year term. He was not a good administrator in this political position, although UNESCO profited greatly by his enthusiasm and broad knowledge, as well as by the loyalty of his staff. At the end of his term, he retired to Hampstead. At seventy-one he was knighted. He gave an address on "The Evolutionary Vision" at the Darwinian Centennial at the University of Chicago, where he was a Visiting Professor. He died at the age of eighty-eight.

Huxley was fond of nature-and solitude. He was early impressed by Wordsworth's line on Tintern Abbey : "I have felt a presence..." He recognized the need to preserve natural beauty and to promote architectual beauty, as well as to conserve natural resources. he exhibited great versatility, and showed a marked concern for human welfare, as illusrated by the following sampling of his activities. In 1924 he gave three lectures at Rice on "The Outlook in Biology", which dealt with the relation of science and humanities, and later, in 1952, became the President of the British Ilumanist Association. In 1935 he published a book entitled *Science and Social Needs,* and was also the first President of the Association of Scientific Workers. Earlier, he had attended the World Population Conference. In 1956 he received the Lasker award of the Planned Parenthood Association in America. Although he favored the development of atomic bombs-under surveillence of the United Nations-he was among the first to oppose the proliferation of nuclear weapons.

In 1920 Huxley did some research of metamorphoses of axcolotls that made headlines. At thirty-three he began his sernipopular writing on science and society. At forty-one he joined the Society for Psychical Research, but failed to rind any proof of communication with departed spirits. With Gavin de Beer he published *Principles of Experimental Embryology* (1934). At forty-eight he gave the Royal Institution Christmas Lectures on "Rate Animals and the Disappearance of Wild Life". His forte was publication, particularly popularization. At fifty-five he published *Evolution, the Modern Synthesis.* A year later, as his grandfather had done fifty years earlier, he delivered the Homanes Lecture on "Evolutionary Ethics". **In 1953 he received the Kalinga prize for popular science and the Royal Society Darwin medal for his contributions to the theory of evolution.**

Huxley believed in the uniformity and unity of nature, but above all, in the continuous development of a single, ultimate world-substance. Evolutionary naturalism was his basic hypothesis; evolutionary humanism, his thesis-that is, man as the one and only agent for realizing life's further progress. Nevertheless, he claimed, "I consider myself to be a religious man, though I do not subscribe to a theistic interpretation of the religious spirit." This conclusion is based upon his own definition of religion, viz. "the reaction of the personality as a whole to its experience of the universe as a whole," particularly to "a man's holding certain things in reverence" and "his feeling and believing them to be sacred." He admitted however, that there will probably always be a

conflict between naturalistic science and theistic religion.

Huxley's own confusion can be traced back to the indefiniteness of his religious heritage and the amorphism of his own religious education. His maternal great grandmother was mildly liberal and low-church orthodox. Her son, his grandfather, left the Anglican Church twice to become Roman Catholic. Another son, Matthew Arnold, upset people with his own critical faculty, despite a moral temperament and strong religious leanings. Julian claimed that his paternal grandfather, Thomas Huxley, a self-classified agnostic, was actually religious in view of his sense of reverence. As a child, Julian was wont to attend church only on festive occasions such as Christmas or Easter. He did admit, however, his enjoyment of the Eton chapel services, probably because of the prevelant atmosphere of awe and reverence.

In the reading of an essay by Archbishop William Temple, he was stimulated to study philosophy and religion so that he read much along this line. He was particularly impressed by his aunt Mary Augusta (n6c Arnold) Ward's "Robert Elsmere" (1887) with its emphasis upon social mission and its dismissal of 'legendary miracles.' His thinking about religious humanism was actually triggered in Colorado by his reading of John Morley's challenging comment, "The next great task of science will be to create a religion for humanity." In 1928 he published *Religion With Revelation,* which was amplified in 1956.

Works of Julian Huxley- A Gifted Exponent of Science:

- Essays of a Biologist (1923)
- Animal Biology (with J.B.S. Haldane, 1927)
- Religion Without Revelation (1927, revised 1957)
- The Tissue-Culture King (science fiction, 1927)
- The Science of Life (with H.G. & G.P. Wells-1931)
- Scientific Research and Social Needs (1934)
- Thomas Huxley's Diary of the Voyage of H.M.S. Rattlesnake (1935)
- We Europeans (with A.C. Haddon, 1936)
- The present standing of the theory of sexual selection. In G.R. de Beer (Ed.), Evolution : Essays on aspects of evolutionary biology (pp. 11-42). Oxford : Clarendon Press (1938)
- The Living Thoughts of Darwin (1939)
- The New Systematics (1940)
- Evolution : the Modern Synthesis (1942)
- Evolutionary Ethics (1943)
- Touchstone for Ethics (1947)
- Man in the Modern World (1947) eBook (http://www.archive.org/details/Man In The Modern World)
- Heredity, East and West (1949)
- Evolution in Action (1953)
- Biological Aspects of Cancer (1957)
- Towards a New Humanism (1957)
- New Bottles for New Wine (1958)
- The Humanist Frame (1962) elaborated to Essays of a Humanist (1964) elaborated Evolutionary Humanism
- From an Antique Land (1966)
- The Courtship Habits of the Great Grebe (1968)
- Memories (2 vol., 1970 and 1974)

Kalinga Laureate for Popularization of Science - 1954

Kaempffert, Dr. Waldemar (Bernhard), USA

[Born : 27th September, 1877
Died : 27th November, 1956]

In size the electron bears the same relation to an atom that a baseball bears to the earth. Or, as Sir Oliver Lodge puts it, If a hydrogen atom were magnified to the size of a Church, and electron would be a speck of dust in that Church.

It so happens that the United States and Great Britain have taken the lead in broadcasting. If that lead is maintained it follows that English must become the dominant tongue. Compared with our efforts at mass entertainment and mass education, European competition is pathetic. All ears may eventually be cocked to hear what the United States and Great Britain have to say. Europe will find it desirable, even necessary, to learn English.

1924- Waldemar Kaempffert, "The Social Destiny of Radio"

KAEMPFFERT, Dr. WALDEMAR (BERNHARD) :
A LIFE WELL LIVED

American Science Editor; born Sept, 23, 1877, New York City; son of Bernhard and Juliette Kaempffert; educated at College of City of New York; B.Sc.; Clarkson Inst. of Technology, D.Sc.; New York Univ., LL.B. 1903; married Carolyn Lydia Yeaton, Jan. 7, 1911 (dec. 1933). Admitted to New York Bar, 1903, registering as a Patent Attorney. Asst. Editor, Scientific American, 1897-1911; Managing Editor, 1911-15; edited Popular Science Monthly, 1915-20; Science Editor New York Times since 1927 (with exception of 1928-31, active as Director, Museum of Science and Industry in Chicago) Member; Historical Scientific Soc.; Natl. Assn. of Science Writers (Pres. 1937); Amer. Assn. for Advancement of Science. Author; The New Art of Flying, 1911; The ABC of Radio, 1922; Invention and Society 1930; Science Today and Tomorrow 1939 and 1945; Changing Views of Evolution (Current History); Science, Technology and War (Yale Review); Why Can't We Live Forever ? Rocket Ships and a Visit to Mars. Editor; Coller's Wonder Book, 1920; A Popular History of American Invention, 1924.

BIOGRAPHY

Waldemar Kaempffert

(September 27, 1877- November 27, 1956)
Most Famous US Science Writer and Museum Director.

Waldemer (Bernhard) Kaempffert was born and raised in New York City. He received his B.S. from the City College of New York in 1897. Thereafter he was employed by *Scientific American,* first as a translator (1897-1900) then as managing editor (1900-1916). In 1916, he started working as the editor of *Popular Science Monthly.* In 1922, he left to become the Editor of Science and Engineering at the *New York Times.*

In 1928, following a nationwide search for a director, the Museum of Science and Industry Chicago asked Kaempffert to become its first director. He enthusiastically devoted himself to the work of laying out the history of the sciences and of the industries. He encourage his curators and exhibit designers to base their exhibits on careful research in order to be as objectively true as possible. This devotion to objectivity, however, led to disputes with the board of directors, especially around the appointment of George Ranney who was also a director of International Harvester. This appointment created a conflict of interest in the museum, as International Harvester was contributing to an exhibit on farm tractors which claimed that an IH predecessor company was responsible of the invention of the tractor. Research by both Kaempffert and his staff showed otherwise, but he could not antagonize donors to the museum nor his board of directors with the "truth." He therefore compromised his objectivity.

The board also found issue with Kaempffert's cost accounting. The board, all business executives, kept careful track of every dollar spent. Kaempffert however was more lax in his accounting. No wrongdoing was alleged, but the board wanted greater oversight. To achieve that, the board created a new layer of management, "assistant directors," who reported not only to Kaempffert but also directly to the Board. It was the usurpation of Kaempffert's authority that led him to ask, in January of 1931, the *New York Times* if he could have his old job back and, by a coincidence, the *Times* agreed. He remained with the *Times* until his retirement in 1956. He was succeeded as science editor by William L. Laurence.

Kaempffert was a member of the American Society of Mechanical Engineers, History of Science Society, National Association of Science Writers (serving as the president in 1937), and the Newcomen Society.

Awards :

The New York Times received the Laskar Foundation Awards for the Excellence of its daily medical reporting, with a citation to Waldemar Kaempffert for his authoritative weekly columms, "Science in Review". Waldemer Kaempffert became Science Editor of the New York Times in the year 1927. On June 7, 1931-Waldemar Kaempffert, an Engineer, who had been writing on Science Topics for The Times beginning 1927, introduces a regular science column in the sunday edition.

Reference :

- Jaques Cattel, ed., *American Men of Science : A Biographical Directory,* 9th ed., vol.1 Physical Sciences (Lancaster, PA : The Science Press, 1955), s.v. "Kaempffert, Waldemar Bernhard."
- For information on Kaempffert's tenure with the Museum of Science and Industry Chicago see Jay Pridmore, *Inventive Genius : The History of the Museum of Science and Industry Chicago* (Chicago : Museum of Science and Industry, 1996), pp.26-48
- Waldemar Kaempffert : "The Social destiny of Radio" Forum, Vol. 71, #6, pp764-769.
- Waldemar Kaempffert : "Science Editor of the Times, 79" Newyork Times, Nov.28, 1956, P-35.

Museum of Science and Industry (Chicago)

The Museum of Science and Industry is located in Chicago, Illinois in Jackson Park, in the Hyde Park neighborhood. It is housed in the only in-place surviving building from the 1893 World's Columbian Exposition, the former Fine Arts Building.

The building, which was intended to be a more permanent structure than the other Exposition buildings, initially housed the Field Museum of Natural History. When a new Field Museum building opened closer to the downtown in 1921, the former site was left vacant. After a few years, the building was selected as the site for a new science museum. The building's exterior was re-cast in stone, retaining its 1893 Beaux Arts look, while the interior was completely rebuilt in Art Deco style.

The museum was establised in 1926 by wealthy Sears, Roebuck & Company chairman Julius Rosenwald, who pledged $3 million to the institution. He eventually donated over $5 million. He also insisted that his name not appear on the building, but nonetheless, for the first years of museum's existence, it was known as the Rosenwald Industrial Museum. Rosenwalds' vision was to create an interactive museum in the style of the Deutsches Museum.

The museum conducted a natonwide search to find its first director. In the end the board of directors selected Waldemar Kaempffert because he shared Julius Rosenwald's vision. Kaempffert was the science editor for the New York Times. He assembled the museum's first staff and began organizing and constructing the exhibits. He was also instrumental in developing close ties with the science departments of the University of Chicago which supplied much of the scholarship for the exhibits. Kaempffert resigned in early 1931 amid growing disputes between himself and the board of directors over the objectivity and neutrality of the exhibits and his management of the staff.

The new Musuem of Science and Industry was first opened to the public in 1933 during the Century of Progress Exposition.

In keeping with Resonwald's vision, many of the exhibits are interactive, ranging from the Hall of Communications which explains telephony, to the coal mine, which re-creates a mine inside the museum. The museum houses the U-505, the only German submarine captured by the US in World War II, silent film actress Colleen Moore's Fairy Castle and the Transportation Zone which includes exhibits on air and land transportation. The first diesel-powered streamlined stainless-steel trainset, *Pioneer Zephyr,* is on permanent display.

The Henry Crown Space Center at the Museum of Science and Industry includes the Apollo 8 capsule which took Frank Borman, James Lovell and William Anders on the first lunar orbital mission. Other exhibits include an OmniMax theater, Scott Carpenter's Mecrucy Atlas 7 capsule, a Lunar Module trainer and a life-size mockup of a space shuttle.

In addition to its three floors of standing exhibits, the Museum of Science and Industry also hosts temporary and travelling exhibits. In 2000, it created and hosted the largest display of relics from the wreck of *Titanic.* It also hosted Gunther von Hagens' Body Worlds exhibit, a view into the human body through use of plastinated human specimens.

The museum is known for unique and quirky permanent exhibits, such as a walk-through model of the human heart. Due to its age and design, the "Sci and I" building itself become a museum piece.

Kalinga Laureate for Popularization of Science - 1955

Doctor Augusto Pi Suner, Venezuela

[Born : 12th August,1879, Barcelona (Spain)

Died : 12th January, 1965, City of Mexico]

Doctor Augusto Pi Suner
(Pi Sunyer Augusto)

Doctor Augusto Pi Suñer *was a Medical physiologist, professor and writer. He was son of Jaime Pi Suñyer and Carolina Sunyer. He studied in the University of Barcelona (Spain) where he was graduated as a medicine lawyer, in 1899. He received the doctorate in Madrid in the year 1900. In 1904, he was titular professor of the chair of Physiology in the University of Seville. He was member of the Medicine Academy of Barcelona in 1910, happened in 1916 to carry out the chair of Physiology in the University of Barcelona, until 1939. He was dedicated to the scientific research in physiology, in the Municipal Laboratory of Barcelona, directed by Ramon Turró. In 1920, he founded the Society of Biology. He directed the Institute of Physiology of Barecelona, where he created a shcool of the great international prestige, in whose publications he presented numerous scientific works. Elect deputy to Cortes like federal republican (1916-1923), was member of the Council of General Culture of Catalonia (1932-1939), and member of the Meeting of Extension of Studies and Scientific researches of Madrid and of the Patronage of Government of the Independent University of Barcelona (1933-1939). When finishing the Spanish Civil War exilió to France, where he exerted the teaching staff in the University of Tolosa until his transfer to Venezuela, in June of 1939, contracted by the Ministry of Education to reorganize the education of the physiology in the country. He carried out teaching in the National Pedagogical Institute and the central University of Venezuela, on which he founded and he directed the Experimental Medicine Institute and formed a remarkable group of disciples. In 1945, he founded the Catalan Center of Caracas, of which he was the first president. Naturalized in 1952, he remained in Caracas, until 1962, when he decided to call to account himself in Mexico, where he died. The works written by Augusto Pi Suñyer are eminently scientific, although he is a character book author and also a great literateur, in prose and verse. He wrote in Castilian and Catalan.*

Biographical Sketch:

Doctor Augusto Pi Suner was born in Barcelona, Spain on 12 of August of 1879, in a family of famous doctors. He was Medicine doctor in the year 1900. He oriented himself immediately towards the investigation and soon he has to stand out like one of the best physiologists of the world. He was Professor Auxiliar de Fisiologi'a in the Medicine Faculty, University of Barcelona in 1902. He was also Numerario University Professor of Human Physiology, by opposition in the Medicine Faculty of Seville in 1904. He became Numerario University Professor of Physiology in the Medicine Faculty in Barcelona in 1916. He was also Numerario member of the Real Medicine Academy of Barcelona in 1911. He became President of the Real Medicine Academy of Barcelona 1926-1939. Member of the ÍInstitute de Ciencies (Institut d' Estudis Catalans).

He obtained Doctor "Honoris Causes" of the University of Toulouse in 1922, and of the Central University of Venezuela in 1947. He was Honorary member of the Medicine Academy of Buenos Aires in 1919, of the Medicine Academy of Paris in 1947, of the Institute of Sciences of Coimbra in 1919, of the "Kaiserlich Deutsche Akademie der Naturförscher", Finds a. S. in 1937, of the Real Medicine Academy of Montevideo, Member of Honor of the Medical Association Argentina, of the Scientific Association Argentina and Titular of the Chair "Ramon and Cajal" in the University of Buenos Aires in 1919. Doctor Pi Sunyer Augusto was a Member Honorario-Fundador of the Venezuelan Association for the Advance of Science in 1950. He was Honorary member of the Society Argentina de Biologi'a in 1941 and of the Societies of Biology of Paris, of the Belgian, for Society Experimental Biology and Medicine of New York and Fundador of the Societat de Biologi'a of Barcelona "Chevalier of the Legion 1920" Officier and Honneur d'd' Instruction Publique" in 1918. Commander gives " Ordem de S. Tiago gives Sword" in 1921. He obtained the medal of Instruction of the Republic of Venezuela in 1945, National Prize "Achúcarro" by investigations on nervous physiology in 1972, Prize 'Pourat". "Intitut de France" (Academy of Sciences) by the book on Neurovegetativo System in 1948. He also obtained Prize of the Council of Public Instruction of Spain and of the "Meeting for Extension of Studies and Scientific researches" of Spain, and of the "Consell de Cultura of the Generalitat de Catalunya". He was Member of the Patronage of Government of the Independent University of Barcelona, Director of the "Institute de Fisiologi'a" of Barcelona (Generalitat de Catalunya), and Professor of Physiology of the Medicine Faculty of the Central University of Venezuela from 1940. He became Professor of Biology and Biochemistry of the National Pedagogical Institute of Venezuela from 1942, and was Director -Fundador of Experimental Medicine Institute from 1940 to 1951.

He received the Most Prestigious International Kalinga Prize in the 1955, Prize created by Kalinga Foundation Trust, a leading Cultural Foundation of Orissa, India and granted by UNESCO. Pi Suñer worked during 48 years in Spain, Argentina and Venezuela. He has written 18 books, among them two in English : The Bridge of Life (1950) and Classics of Biology (1955). He published more than 200 scientific works, written in Castilian, many in French, others in Catalan and several in English and German, all related to different aspects from medical sciences such as nutrition, metabolism, biochemistry, endocrinology and physiology. Even though he was attached to the rigid disciplines of the scientific method, Pi Suñer knew to elevate his thought until penetrating with sobriety, tino and elegance in the field of Literature and the physiology.

The illustrious life of this Catalan intimately is bound to the progress of Physiological Sciences in three countries: Spain, Argentina and Venezuela.

Like militant of the Republican left party of Catalonia, during 5 years, as of 1918, he was delegated to Cuts by Figueres. Raised with weather and dignity dragging the vicissitude next to his, bore

that long night of anguishes and pains that were the civil war. Later he had to face the unforeseeable luck of exile, to let his earth to remain with a conviction.

When finalizing the war of Spain, Doctor Pi Suñer was in France. On behalf of the Committee of "recherche Scientifique" he worked in 1939, when the Minister of National Education of Venezuela, Enrique Tejera, made be worth his influences before the Venezuelan Government to obtain the hiring of the services of professor Pi Suñer. He arrived tomorrow at Caracas in a free from April of 1939. According to Graci'a Arocha wrote, Pi Suñer arrived at our mother country under only the shelter from its Science and its conscience, any by all company, the suitcases of the exile, the wife to whom adored and a few books under the arm. He was gotten up to the Chair of Physiology, in which he found his two first disciples : Doctor Humberto Garci'a Arocha who was Head of the Practical Works and Doctor Marcel Granier - Doyeux that carried out the position of Preinn. Since then Pi Suñer began to elaborate the ambitious project that would be to culminate in the foundation of the Experimental Medicine Institute, for which he counted on the enthusiastic collaboration of the then Director of the Central University of Venezuela, Doctor Antonio Jose Castle. During the months of July, August and September of 1939, the means studied at great length to take to happy term the mentioned project, surely and effectiveness the list of the material that had to be requested were elaborated with care and the suitable premises looked for. Thanks to a new intervention of Doctor Tejera, secundado by the Governing Castle, chose two small houses located in the Avenue San Martin for the provisional Installation of an institution of test. Simultaneously with this creative work, a partial reform of the training program in the Faculty of Medical Sciences was carried out. A stage of waves was begun reforms. His scientific thought, forged in the strong disciplines of the laboratory, influenced powerfully to make change the points of view of a purely descriptive medicine, circumscribed to symptoms, semiológicas explorations, clinical histories and evidences. Pi Suñer said that the disease is expression of the altered function and this one cannot be included/understood until as much do not penetrate the physical mechanisms, chemical and physical-chemistries that characterize the normal function. Other words over and over again, Pi Suñer stressed that the medicine, to become scientist, has to analyze the clinical fact to the light of the fisiopatológicos processes, structural and biochemical that determine each ailment and each disease. This was the essence of all its lessons of Physiology and the courses of Fisiopatologia that was called on to dictate to him. In the land of Physiological Sciences, Pi Suñer changed the resources necessary to organize laboratories. It was as well as between us; he turned the Physiology, the Fisiopatologia and the Pharmacology in to experimental sciences. The Chair of Biochemistry in substitution of the one of Medical Chemistry was created. The one of Fisiopatologia in connection with the one of General Pathology was created and anachronistic Chair of Therapeutic General and Medical Matter by the modern one of Pharmacology was replaced.

The Institution of test quickly began to give fruits of appreciable value, is so the 28 of June of 1940 became a memorable day in annals of the Venezuelan Medicine. The Minister of National Education, Professor Arturo Uslar Pietri declared inaugurated the Experimental Medicine Institute in an act witnessed by notary public and solemn which he attended with the President of the Republic, General Eleazar Lopez Contreras.

In Venezuela, Augusto Pi Suñer wrote ten books, two novels, multitude of tests and monographs, collections in scientific magazines and cultural publications. Facing the adversity, trocó pain and congoja in uncontrollable eagerness of work and creation. Augusto Pi Suñer died (Mexico the 12 of January of 1965) leaving us the fullness of his work and neatness of his example. And as Garci'a Arocha said to Doctor Humberto

(his disciple), who when evoking to him, the memory recreates in its beautiful human dimension. Because over the scientist, the writer and the university professor always his generous spirit overflowed, he always showed the candor that he retained of the childhood, straight line the irrevocable position and the gesture in the nobility and dignity. Who circumscribles his tasks to give classes, to instruct or to give explanations is, in any case, the professor, the university professor or the teacher of school or factory. But who does not settle down limits to exert his pedagogia, that really persecutes universal goals, of justice and beauty to illuminate with his lesson the scope of the classroom and the penumbrae of the street, that is the Teacher. Teacher was Augusto Pi Suñer. It is not easy in the same way to have a teacher, because the Teacher is born Masterful, who is born a young painter and another one is born poet. A bronze plate with the efigie of the Teacher, placed in the present seat of the Experimental Medicine Institute, remembers to all the meaning of the work made by the Teacher in its mother country of adoption. The future generations of students will be able to see in him the sincere testimony of the gratitude of his first disciples and collaborator.

Iconography :

It photographs, Elite caracas, núm. 2.101, January 1, 1966. It Photographs, Alfredo Boulton 1950, Images, Caracas : 1982. Photography, We, Caracas, núm. 14, August 1962. Photographies, collection National Library, Caracas. Photography, the National Caracas, January 14, 1965.

Source :

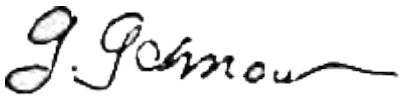
Polar foundation, Dictionary of History of Venezuela, 2a Edition, Caracas : Polar Foundation, 1997.

Books by Doctor Augusto Pi Suner :

1. **Classics of Biology**
   Format : Paperback
   Publication Date : January 2003
2. Bridge of Life : From Reality to Mystery
3. The Bridge of Life
4. Principio Y Termino De La Biologia
5. The Problem of the metabolism. Conference of Extension of Medical Culture, Celebrated in the Real Medicine Academy of Madrid. **Publication :** Madrid, Est Tip Enrique de Teodoro, 1917.

Kalinga Laureate for Popularization of Science - 1956

Dr. George Gamow, USA



[Born : 4th March,1904, Odessa, Russia
Died : 19th August, 1968, Boulder, Colorado, USA]

"High Joe ! You, and your damned molecular models ! Today I got a whole box of them to build such a simple thing as DNA molecule (i.e. two Ribosephosphate chains with few Adenines, Thymines, Guanines, and Cytosines between them), and to see if the 20 amino acids would fit into the loops like a key into a lock. And I cannot even build a sugar ! How do you make [drawing of a molecule here] for example ? Yours, (s) Geo. P.S. Rho is fascinated by that game and asks you to send her as a present ten (10) boxes of atoms".

Letter from George Gamow to Joe Hirschfelder. October 22, 1953.

George Gamow

Genius and Humour from Cosmology to Proteins

Gamow, George *(04.03.1904-19.08.1968), Russian-American theoretical physicist and author, b. Odessa. A nuclear physicist, Gamow is better known to the public for his excellent books popularizing abstract physical theories. He did his earlier research at the Univ. of Copenhagen, Cambridge Univ., and the Univ. of Leningrad, where he was professor (1931-33). He then came to the United States, where he taught at George Washington Univ. (1934-56) and the Univ. of Colorado (from 1956) and served with U.S. government agencies. He formulated (1928) a theory of radioactive decay and worked on the application of nuclear physics to problems of stellar evolution. He was one of the first proponents of the "big bang" theory of cosmology. In 1954 he proposed an important theory concerning the organization of genetic information in the living cell. His writings include Constitution of Atomic Nuclei (1931; 3d ed., with C.L. Critchfield, Theory of Atomic Nucleus, 1949), Mr. Tompkins in Wonderland (1939), One, Two, Three.. Infinity (`1947, rev. ed. 1961), The Creation of the Universe (1952, rev. ed. 1961), Mr. Tompkins Learns the Facts of Life (1953), The Atom and Its Nucleus (1961), and Gravity (1962).*

See his autobiography, *My World Line (1970).*

Biographical Sketch :

George Gamow (Georgi Antonovich Gamow, "Geo" for his friends) was a great physicist, and one of the scientists who formulated the theory of the Big Bang. He was born on the 4th of March, 1904 in Odessa, Russia. His father Anthony M Gamow was a professor of school of secondary education. His mother was Alexandra Lebedinzeva. Very early, in his student days, he was fascinated by astronomy and, when he was thirteen years of age, his father gave his first telescope to him, with which he studied stars patiently. This helped in arousing great passion of a scientist in him.

In 1922, he started his university studies. First in the University of Novorossia, his native city. Later, in 1923, he enters the University of Petrograd (ahora Leningrad) where he studied optics and cosmology, withdrawing from that establishment of superior education in the year 1928. In 1926, he attended the school of summer of the University of Göttingen in Germany. Already, in that time, his formation was solid and could give to answers and demonstrable solutions to ten mysterious phenomena of the natural radioactivity. Like example, we can indicate among others, the formulation that he developed of the quantum theory of the radioactivity, the first guessed right explanation of the behavior of the radioactive elements, some of which decay in seconds, whereas others do it in thousands of years. Gamow obtained a significant advance of the investigation in Göttingen. Using the theories ondulatorias of Schrödinger, demonstrated that the particles, in certain excited states of energy, can, to all the effects, to lay way until outside the nucleus. The work attracted the attention of many physicists, including Niels Bohr and Ernest Rutherford.

After receiving his graduation in 1928, accepting an invitation of Niels Bohr, he travels to Copenhagen. Bohr was very much interested in his work and, for that reason, offered a scholarship to him of the Real Danish Academy of Sciences to study a year in the Institute of Theoretical Physics. And, it was when he was granted a scholarship of that institute,Gamow proposed the hypothesis that the atomic nuclei can be dealt with like small gotitas of "Nuclear fluid". More than a hypothesis, it was a discovery that lead to the present theory of the fusion and the fission.

The fame of physicist Gamow began with his theory that explained the radioactive decay of the alpha particle of the atomic nucleus. In 1929, he obtained a Rockefeller scholarship of the University of Cambridge. There, Gamow cooperates with F. Noutermans and R. Atkinson, in the attempt to apply his formula to calculate the inductive index of nuclear transformations (thermonuclear reactions) inside stars. It is a formula that is used successfully until today to design hydrogen pumps, and in the studies of possibilities of controlled thermonuclear reactions, fusion. Being in Cambridge, he also concurs to the Cevendish Laboratory, wherein he attends to Ernest Rutherford and he investigated with his equipment. Rutherford requested him that he investigated if, since the particles could be come off the nucleus, they could be induced of some way to penetrate in it, and thus to escindir itself.

To the suggestion of Rutherford, Gamow considered the effects to bomb atomic nuclei with protons artificially accelarated at enormous speeds in a magnetic field of high energy. Their due time, their calculaltions showed that it was possible to penetrate in the nucleus, and that the accelerated protons could stick to it, forming new nuclei. Still more, he determined that the necessary acceleration did not need to be as high as the required one under the laws of the classic physics, a discovery that animated to the investioadores in Cavendish to also construct a particle accelerator. In 1932, this instrument was able to disintegrate light lithium and other nuclei with protons, a great advance that opened the doors to the study of the nuclear physics. In 1931, after his stay in Cambridge, Gamow returned to the Soviet Union where he was assigned as the investigator of the Academy of Sciences of Leningrad. In that same year he married to Luybov Vokhminzeva, and divorced her in 1956. The pair had a son who was born in 1935, called Rustem Igor.

Gamow, during a pair of years, was retained in his country. Irritated before the limitations imposed by more and more the repressive estalinista regime, he decided to look for intellectual fortune elsewhere. In 1933, the frustrated scientist was able to persuade to the authorities that they let to him attend the Congress of the Solvay University in Brussels with his wife Luybov in quality of secretary, it opened the doors to them to escape to the west. Being still in Europe, they visited the Institute Pierre Curie and, at the same time, Gamow became visiting professor of the University of London. After several months of teaching and traveling in Europe, Gamow was able to get an invitation to give a lecture, in 1934,at the University of Michigan. Instead of returning to Europe, Gamow settles down in the U.S.A., where he happened to comprise himself with - the educational body of the George Washington University in Washington, D.C. In that paradise he extended during the following two decades his contemplations of atoms bombed until the very same origins of the universe.

In that Mount Olympus that was for the Russian theoretician his residence in the country of the north, he concentrated his investigations in the atom primigenio conceived by the theoretician-Belgian priest the Georges Lemaitre. Gamow called to that atom the cosmic singularity. If matter and energy were interchangeable, like it was demonstrated by Einstein in his famous equation $E= mc^2$, the enormous densities and the high temperatures at the beginning of the time and of the space - that Gamow nicknamed the Big Squeeze, the Great Estrujon - could have erased the distinction among them. The main component of that ardent stew matter-energy, suggested Gamow, would have been the radiating energy. Soon, while the universe began to expand and to cool off, the first matter in emerging would have done it in form of elementary particles : protons, neutrons and electrons. One of the later collaborators of Gamow, Ralph Alpher, gave the name of “ylem”, a term taken from Aristotle, to this fundamental matter. Of his studies in Cavendish, Gamow had learned that the neutrons, although are stable within the atomic nuclei, are distintegrated

quickly when they are by his account. A solitary neutron has life expectancies of only thirteen minutes before it becomes a proton and an electron. In the ardent density of the young universe, the decomposition of neutrons had to be balanced by the production of new neutrons arisen from the collision of protons and electrons.

But, as "ylem" cooled off and it became less dense, every time less collisions took place and less neutrons were created. At the same time, there was a reduction in the radiation of high energy, which allowed existing neutrons to begin to be combined with protons, forming atomic nuclei since they had done in the particle accelerator of Cavendish. The solitary protons attracted electrons to create hydrogen atoms, and the heaviest nuclei also reunited their greater electron complements. The Big Squeeze could today be the crucible of all the elements observed in the universe.

During World War - II, Gamow was referred to the Manhattan project, to develop the atomic pump. Gamow among other physicists contributed with the investigation in the Poplars, that finally lead to the production of the hydrogen pump.

Once the war was over, Gamow ratakes his investigations on the formation of the elements that tolerates the universe. Form equipment with Alpher, then a student graduated at George Washington, to carry out the difficult calculations that gave support to their theory.

Gamow and Alpher produced a monumental test, but they made a somewhat outlandish debut with a letter that, by coincidence, appeared on the April Fools' Day (first of April, the day of innocents in the United States) of 1948 in the newspaper Physical Review. Gamow, joking dedicating, added to the article the company/signature of the famous atomic physicist Hans Bethe, although Bethe had not had anything to do with the project. (Luckily, Bethe took the joke well.) The resulting list of authors- Alpher, Bethe and Gamow - were a retruecano corresponding to the three first letters of the Greek alphabet, alpha, beta and gamma. Soon Robert Herman added itself to the pair, a colleague of Alpher, and formed a work trio that even lasted after Gamow was transferred to the University of Colorado in 1956.

The joke of Gamow in the Physical Review was appropriate, since the letter to the newspaper presented/displayed a hypothesis on the creation of the first elements of the periodic table. It outlined the process according to which the neutrons and protons collided, they were crowded together and they were reshapeed to form, first, heavy hydrogen (a neutron plus a proton) and soon tritium (two neutrons plus a proton). In the following step, when one of neutrons of the tritium nucleus was disturbed in a proton and an electron escaped, the tritium nucleus was transformed into an isotope form called helium-3. To add another neutron to helium-3 produced the isotope helium-4.

It was just like in the alchemy : In ylem, a substance was transformed into another one. Since then the elaborations of other investigators have revealed how the events described by gaomw and Alpher took place within the first minutes of the cosmic expansion. The processes outlined by them produced the abundance of hydrogen and helium that constitutes ninety and nine percents of all the matter of the universe.

Gamow also explained the distribution that can be observed of the masses in the space. During the first million years, he said, the radiation governed the universe. At that time sufficient matter had formed so that it became predominant, and about 240 million years later great gas expansions began to coagulate. The mass of anvil gas clouds, calculated, was more or less equivalent to the one of the today galaxies.

On the other hand, the investigations of Gamow on the evolution of stars have their departure point in the model of Hans Bethe. As much the heat as the radiation that the stars emit generates in its respective nuclei (thermonuclear

reactions), and it takes place through the consumption of the "fuel" of each one of them. Once the respective fuel of stars is exhausted, these as well are cooled off. Gamow also developed a theory on the internal structure of red giant stars. But in general, the contributions of Gamow in investigations and theories are centered in the sustenation of the model of the Big Bang.

The theory of the Big Bang formulates that the universe was born of a great "explosion" does thousands of million year, and that its present structure is a result of it like its expansion. This idea had empecinado impugnador in the physical outstanding English astronomer Fred Hoyle, who refuted it until his death, happened on 20th of August, 2001 at the age of 86 years. Hoyle, maintaining himself in one of the weaknesses that the hypothesis of Gamow showed on the time that had passed from beginnings of the universe in relation to observed expansion, a called competing hypothesis of the sationary state used (Steady State), supported by two colleagues of Austrian origin, Thomas Gold and Hermann Bondi. The trio proposed that the universe had not had a defined principle but that was infinite, as much temporary as space. During a program of radio in the BBC, he introduced the theory of stationary state and coined the pegadiza expression "Big Bang" (Great Explosion) to describe the model of his rivals that considered it stupid and ridiculous, thus baptizing both sides of a dispute that would continue during two decades. Nevertheless, since then people have thought that, that name is most appropriate to describe what meant the theory, although one says that Gamow in no case was "the contemptuous" source of the name assigned by Hoyle.

Throughout the course of his race, the inclination of Gamow towards giving a slight touch to all the things was worth a considerable success to him in the world of books and, in the process, he removed his esoteric theory outside his ivory tower and he made it penetrate in the public conscience. "The creation of the universe", published in 1952, became best-seller. His own personage created, Mr Tompkins, an absolutely singular man, with whom Gamow described his arguments. He explained, through the pen, complex and difficult theories of a simple way and; he only used mathematics, when it was really essential. For example, in his work "Tompkins in the country of the wonders", in which he explained the general theory of relativity, for the readers it was not only book of cultural extension, if not that also of relaxation and joy. In a poem directed to his wife and inserted in that book, in that he describes the aversion of Fred Hoyle towards his proposals, it leaves of manifesto the literary abilities of Gamow.

GEORGE GAMOW AND THE DNA :

Gamow in his last years, focused his investigations and experiments towards Biology. Between one of his contributions to that discipline, is the solution of the mysteries of the system of codification of the DNA. In 1954, he proposed an important theory referring to the orgnization of the genetic information in the alive cell. In her, he described the possible structure of the DNA. In addition, he was first in suggesting nucleotides tolerated the information based for the protein generation.

On the other hand, Gamow also previewed that the relation between the structure of the DNA and the synthesis of proteins formed a quantitative problem of cryptographic analysis. Gamow conjectured that the goal of scientists was to learn how one releases sequence of 4 nucleotides which determines the allocation of the long protein sequences integrated by 20 amino acids. Gamow published one tastes in the Nature magazine, in October of 1953, in which the "code proposed the application of a called solution makes shine like diamonds", overlapped a triple code based on the combination of a scheme in which three of four nucleotides would at the same time predetermine the specification of 20 amino acids. One was a restrictive and highly hypothetical code, based on the knowledge that was had then on the behavior of nucleic acids and proteins.

The scheme of the code of Gamow woke up a great enthusiasm between the scientists. In order to foment the communication and the camaraderie, Gamow founded the Club of **Necktie RNA (Tie Club RNA)**, formed by twenty well-known scientists that would be led the problem of the codification, and whose number corresponded to the 20 amino acids. Of course, that everything was not study and investigation, also there were meetings of eminently social character. To each member of the club the sobrename of one of the amino acids was assigned to him, and all appeared to the meetings with a diagram, devised according to precise specifications given by Gamow, in the head of a necktie pin. Although geographically their members were dispersed, the club of the necktie arranged to work together to physical scientists and biologists in one of the problems of greater challenge and importance of modern science.

In the middle of 1954, Gamow recognized that his code makes shine like diamonds was not exact; however, as much he as the other members of the club, they continued deliberating on several other codes elaborated by other different investigators. In truth, the notice of a "code" as key of information transference were not published publicly until end of 1954, when Gamow, Martynas Ycas, and Alexander Rich published an article who defined itself, for the first time, the characters of the code, since superficially they had been previously only mentioned in a publication conducted by Watson and Crick, in 1953.

In 1956, Gamow received the Kalinga Prize of UNESCO for his great scientific diffusion. In the same year he was named professor in the University of Colorado, where he remained until his death,which happened on the 19th of August of 1968. One comments that before it happened he said that "finally my liver is presenting/displaying the account", summarizing a life to drink very carefreely, to eat, of the good humor, of sports and a friendly and unusual egotismo. His attitude with respect to the physical one was than manifest more, and their investigative qualities were recognized to him to find conceptually simple solutions front to a variable range of scientific problems.

In 1958, Gamow married Barbara Perkins ("Perky"), his Publisher from Viking Press.

Gamow was an imposing figure at six feet, three inches (190.5cm) and over 225 pounds (102)kg) but was known for his impish sense of humour. He was once described as "the only scientist in America with a real sense of humor" by a United Press International reporter.

He was highly regarded in the Soviet Union before his defection, and had once been a commissioned officer in the Red Army, a fact which likely prevented the US from putting him to work on the Manhattan project during World War 2. The Americans were apparently not swayed by the arguments that Gamow was only given officer status so that he could teach science courses to soldiers and that the USSR had sentenced him to death for his defection.

In his book "My World Line", George Gamow who had been the first after Hubble's discovery to propose a Big Bang (although not using the term), recalls a conversation with Albert Einstein during a walk through the streets of Princeton, on the apparent negative relationship between the energy of gravity & the energy of matter. At one point of the conversation Gamow raised the question of a star being created out of nothing, if positive and negative terms exactly would cancel each other out. The consequence of that innocent remark was a minor traffic jam, since Einstein stopped, contemplating, right in the middle of the street. This little story may provide some consolation for the 'normal" thinker, that he is in best company feeling perplexed when taking higher mathematics at its words.

Position held & other Honours

Visiting Professorships :

- University of Michigan
- Ohio State University
- University of California at Berkeley, and later at Santa Barbara.
- In 1965 Gamow was elected on Overseas Fellow of Churchill College, Cambridge, England.

Consultantships :

- U.S. Navy Bureau of Ordance
- Air Force Scientific Advisory Board
- Army Office of Operation Research
- Los Alamos Scientific Laboratory
- Convair (San Diego, Calif.)

Professorships :

- University of Leningrad (1931-33)
- The George Washington University,
- Washington, D.C. (1933-55), including period of military consultantships.
- University of Colorado, Boulder, Colorado (1956 to date), including faculty fellowship for lecturing in Japan, India and Australia

Other Honours :

- The Soviet Academy of Sciences (membership canceled on Gamow's leaving Russia)
- The Royal Danish Academy of Sciences
- The National Academy of Sciences (USA)
- The International Astronautical Academy
- The American Ass'n for the Advancement of Science
- The American Physical Society
- The American Geophysical Union
- Sigma Xi Honorary Society
- The Washington Philosophical Society
- The Washington Academy of Sciences
- **The Kalinga Prize, awarded by UNESCO in 1956, for the Popularization of Science**
- Gamow's papers and correspondence are being collected by the Library of Congress of the United States of America. Over 100 scientific and popular articles.

Contributions of Dr. George Gamow

Gamow wrote 3 monographs (books on scientific subjects) in nuclear physics which are outdated now after 50-70 years.

At the time they were written (1931, 1937 and 1949) they were important contributions to the research on the structure of atomic nuclei, radioactivity and nuclear energy sources.

He wrote two (educational) text books aimed for college students : Matter, Earth & Sky (1958, rev 1965) and with J.M. Cleveland : Physics : Foundations & Frontiers (1960, rev 1969).

He worked on a third book : Basic Theories in Modern Physics with Richard Blade but it was not completed before he died.

Scientific books :

1. The Constitution of Atomic Nuclei and Radioactivity, Clarendon Press 1931.
2. Structure of Atomic Nuclei and Nuclear Transformations, Clarendon Press 1937
3. Theory of Atomic Nucleus and Nuclear Energy Sources (with C. Critchfield), Clarendon Press 1949.

Educational text books :

1. Matter, Earth & Sky (1958, rev 1965).
2. Physics : Foundations & Frontiers (with J.M. Cleveland), Prentice-Hall (1960, rev 1969).
3. Basic Theories in Modern Physics, not published by Academic Press 1968.

Science for the layman :

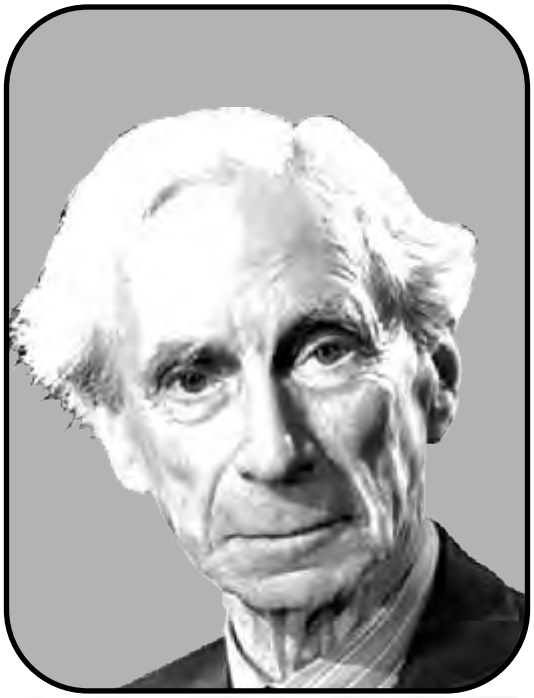
1. Mr. Tompkins in Wonderland, Cambridge University Press 1939.
2. The birth and death of the Sun, Viking Press 1940.
3. Biography of the Earth, Viking Press 1941.
4. Mr. Tompkins Explores the Atom, Cambridge University Press 1944.
5. Atomic Energy in Cosmic and Human Life, Cambridge University Press 1947.
6. One Two Three... Infinity, Viking Press 1947.
7. The Creation of The Universe, Viking Press 1952.
8. Mr. Tompkins Learns the Facts of Life, Cambridge University Press 1953.
9. Moon, New York-Henry Schuman 1953.
10. Puzzle-Math (with M. Stern). Viking Press 1958.
11. The Atom and Its Nucleus, Prentice-Hall 1961.
12. Biography of Physics, Harper & Row 1961.
13. Gravity, doubleday & Co. 1962.
14. A Planet Called Earth, Viking Press 1963
15. A Star Called the Sun, Viking Press 1964.
16. Mr. Tompkins in paperback, Cambridge University Press 1965.
17. Thirty Years That Shook Physics, Doubleday & Co. 1966.
18. Mr. Tompkins Inside Himself (with M. Ycas), Viking Press 1967.
19. My World Line : An Informal Autobiography, Viking Press 1970.

Articles :

Gamow wrote about 100 scientific articles in different journals like The Physical Review (25), Nature (22), Scientific American (11), The Astrophycal Journal (7), Zeitschrift für Physik (8) and Physikalische Zeitschrift (4). Most of them he wrote alone, but among his collaborates we should mention Edward Teller, R. Herman and a couple of Ph.D students : Ralph Alpher and M. Schoenberg.

Kalinga Laureate for Popularization of Science - 1957

Bertrand Arthur William Russell, UK



Bertrand Russell

[Born : 18th May 1872 in Ravenscroft, Trelleck, Monmouthshire, Wales, UK
Died : 2nd February 1970 in Penrhyndeudraeth, Merioneth, Wales, UK]

Through the long years
I sought peace,
I found ecstasy, I found anguish,
I found madness,
I found loneliness
I found the solitary pain
that gnaws the heart,
But peace I did not find.

Bertrand Russell

What I have Lived for

Three passions, simple but overwhelmingly strong, have governed my life : the longing for love, the search for knowledge, and unbearable pity for the suffering of mankind. *These passions, like great winds, have blown me hither and thither, in a wayward course, over a deep ocean of anguish, reaching to the very verge of despair.*

I have sought love, first, because it brings ecstasy - ecstasy so great that I would often have sacrificed all the rest of life for a few hours of this joy. I have sought it, next, because it relieves loneliness - that terrible loneliness in which one shivering consciousness looks over the rim of the world into the cold unfathomable lifeless abyss. I have sought it, finally, because in the union of love I have seen, in a mystic miniature, the prefiguring vision of the heaven that saints and poets have imagined. This is what I sought, and though it might seem too good for human life, this is what - at last - I have found.

With equal passion I have sought knowledge. I have wished to understand the hearts of men. I have wished to know why the stars shine. And I have tried to apprehend the Pythagorean power by which number holds sway above the flux. A little of this, but not much, I have achieved.

Love and knowledge, so far as they were possible, led upward toward the heavens. But always pity brought me back to earth. Echoes of cries of pain reverberate in my heart. Children in famine, victims tortured by oppressors, helpless old people a hated burden to their sons, and the whole world of loneliness, poverty, and pain make a mockery of what human life should be. I long to alleviate the evil, but I cannot, and I too suffer.

This has been my life. I have found it worth living, and would gladly live it again if the chance were offered me.

Bertrand Russell

Biographical Sketch

British philosopher, mathematician and social critic, one of the most widely read philosophers of the last century. Bertrand Russell was awarded the Nobel Prize for Literature in 1950. In his memoirs he mentions that he formed in 1895 a plan to "write one series of books on the philosophy of the sciences from pure mathematics to physiology, and another series of books on social questions. I hoped that the two series might ultimately meet in a synthesis at once scientific and practical."

"The belief that fashion alone should dominate opinion has great advantages. It makes thought unnecessary and puts the highest intelligence within the reach of everyone. It is not difficult to learn the correct use of such words as 'complex', 'sadism', 'Oedipus', 'bourgeois', 'deviation', 'leaf'; and nothing more is needed to make a brilliant writer or talker." (from 'On Being Modern-Minded' in *Unpopular Essays,* 1950)

Bertrand Russell was born inTrelleck, Gwent, the second son of Viscount Amberley. His mother, Katherine, was the daughter of Baron Stanley of Aderley. She died of diphtheria in 1874. Her husband died twenty months later, after a long period of gradually increasing debility. Lord Amberley was a friend of John Stuart Mill - he was "philosophical, studious, unworldly, morose, and priggish," wrote Russell later in his autobiography. Katherine, whom Russell only knew from her diary and her letters, he described as "vigorous, lively, witty, serious, original, and fearless." When she died she was buried without any religious ceremony. At the age of three Russell was an orphan. He was brought up by his grandfather, Lord John Russell, who had been prime minister twice, and his wife Lady John.

Inspired by Euclid's *Geometry,* Russell displayed a keen aptitude for pure mathematics and developed an interest in philosophy. "I like precision," he once said. "I like sharp outlines. I hate misty vagueness." However, when he was about fourteen he become interested in theology, but during the following years he rejected free will, immortality, and belief in God. He read widely, mostly books from his grandfather's library, but it was only at Cambridge, when he started to read such "modern" writers of the early 1890s as Ibsen, Shaw, Flaubert, Walt Whitman, and Nitzsche. At Trinity College, Cambridge, his brilliance was soon recognized, and brought him a membership of the 'Apostles', a forerunner of the Bloomsbury Set. After graduating from Cambridge in 1894, Russell worked briefly at the British Embassy in Paris as honorary attachè. Next year he became a fellow of Trinity College. Against his family's wishes, Russell married an American Quaker, Alys Persall Smith, and went off with his wife to Berlin, where he studied economics and gathered data for the first of his ninety-odd books, GERMAN SOCIAL DEMOCRACY (1896). A year later Russell's fellowship dissertation, ESSAY ON THE FOUNDATION ON GEOMETRY (1897) came out. "It was towards the end of 1898 that Moore and I rebelled against both Kant and Hegel. Moore led the way, but I followed closely in his footsteps", Russell wrote in *My Philosophical Development* (1959).

THE PRINCIPLES OF MATHEMATICS (1903) was Russell's first major work. It proposed that the foundations of mathematics could be deduced from a few logical ideas. In it Russell arrived at the view of Gottlob Frege (1848-1925), that mathematics is a continuation of logic and that its subject-matter is a system of Platonic essences that exist in the realm outside both mind and matter. PRINCIPIA MATHEMATICA (1910-13) was written in collaboration with the philosopher and mathematician Alfred North Whitehead. According to Russell and Whitehead, philosophy should limit itself to simple, objective accounts of phenomena, Empirical knowledge was the only path to truth and all other knowledge was subjective and misleading. - However, later Russell became

sceptical of the empirical method as the sole means for ascertaining the truth, and admitted that much of philosophy does depend on unprovable a priori assumptions about the universe. He, however, maintained in contrast to Wittgenstein, that philosophy could and should deliver substantial results : theories about what exists, what can be known, how we come to know it.

After Principia Russell never again worked intensively in mathematics. Russell's interpretation of numbers as classes of classes was to give him much trouble : if we have a class that is not a member of itself-is it a member of itself ? If yes, then no, if no, then yes. After discussions with Wittgenstein Russell accepted the view that mathematical statements are tautologies, not truths about a realm of logico-mathematical entities.

Russell's concise and original introductory book, THE PROBLEMS OF PHILOSOPHY, appeared in 1912. He continued with works on epistemology, MYSTICISM AND LOGIC (1918) and ANALYSIS AND MIND (1921). In his paper of 1905, 'On denoting', Russell showed how a logical form could differ from obvious forms of common language. The work was the foundation of much twentieth-century philosophizing about language. The essential point of his theory, Russell later wrote, "was that althought 'the golden mountain' may be grammatically the subject of a significant proposition, such a proposition when rightly analysed no longer has such a subject. The proposition 'the golden mountain does not exist' becomes 'the propositional function "x is golden and a mountain" is false for all values of x'." (from *My Philosophical Development)*

In 1907 Russell stood unsuccessfully for parliament as a candidate for the Women's Suffragette Society, and the next year he became a Fellow of the Royal Society. Believing that inherited wealth was immoral, Russell gave most of his money away to his university. His marriage ended when he began a lengthy affair with the literary hostess Lady Ottoline Morrell, who had been a close friend of the Swedish writer and physician Axel Munthe (1857-1949). Other liaisons followed, among others with T.S. Eliot's wife Vivien Haigh-Wood. Later Russell wrote about his sexual morality and agnosticism in MARRIAGE AND MORALS (1929). Russell stated the human beings are not naturally monogamous, outraging many with his views. He also opposed existing laws against homosexuality and maintained that sexual relations between unmarried people are not morally wrong.

At the outbreak of World War I, Russell was an outspoken pacifist, which lost him his fellowship in 1916. At the beginning of the war, he helped orgazine a petition urging that Britain remain neutral. In 1918 Russell served six months in prison, convicted of libelling an ally - the American army - in a *Tribune* article. While in Brixton Gaol, he worked on INTRODUCTION TO MATHEMATICAL PHILOSOPHY (1919). World War I darkened Russell's view of human nature. "I learned an understanding of instinctive processes which I had not possessed before." Also Ludwig Wittgenstein's criticism of Russell's work on the theory of knowledge disturbed his philosophical self-confidence. Russell visited Russia in 1920 with a Labour Party delegation and met Vladimir Lenin and Leon Trotsky, but returned deeply disillusioned and published his sharp criticism, THE PRACTICE AND THEORY OF BOLSHEVISM (1920).

In 1922 Russell celebrated his 50th birthday, believing that "brain becomes rigid at 50." He was a famous and controversial figure - "Bertie is a fervid egoist," Virginia Wollf wrote in her diary about her friend, but Russell saw himself as "a non-supernatural Faust." From about 1927 to 1938 Russell lived by lecturing and writing on a huge range of popular subjects. In 1927 he gave a lecture, 'Why I am not a Christian', in which he stated that "The whole conception of God is a conception derived from the ancient Oriental despotisms. It is a conception quite unworthy of free men. "Russell' views were attacked by T.S. Eliot in his journal *The Monthly Criterion.* Eliot

wrote that "Atheism is often merely a variety of Christianity", and Russell's "non-Christianity is merely a variety of Low Church sentiment." Russell pursued his philosophical work in THE ANALYSIS OF MIND (1921) and THE ANALYSIS OF MATTER (1927). Between the years 1920 and 1921 he was professor at Peking, and in 1927 he started with his former student and second wife Dora Black a progressive school at Beacon Hill, on the Sussex Downs. In ON EDUCATION (1926) Russell called for an education that would liberate the child from unthinking obedience to parental and religious authority.

The experiment at Beacon Hill lasted for five years and gave material to the book EDUCATION AND SOCIAL ORDER (1932). In 1936 Russell married Patricia Spence, who had been his research assistant on his political history FREEDOM AND ORGANIZATION (1934). In 1938 he moved to the United States, returning to academic philosophical work. He was a visiting professor at the University of California at Los Angeles, and in 1940 he was appointed Professor of Philosophy at the College of the City of New York. The appointment was revoked and he was barred from teaching basically because of his libertarian opinions. Judge McGeehan declared that "considering Dr Russell's principles, with reference to the Penal Law of the State of New York, it appears that not only would the morals of the students be undermined, but his doctrines would tend to bring them, and in some cases their parents and guardians, in conflict with the Penal Law". The judge also tried to hint that Russell promoted the practice of masturbation, in which he referred to Russell's book entitled EDUCATION AND THE GOOD LIFE (1926). From California Russell went to Harvard, where his lectures proceeded without incidents. An appointment from the Barnes Foundation near Philadelphia gave Russell an opportunity to write one of his most popular works, HISTORY OF WESTERN PHILOSOPHY (1945). Its success permanently ended his financial difficulties and earned him the Nobel Prize. In 1944 Russell returned to Cambridge as a Fellow of his old college, Trinity.

During World War - II Russell abandoned his pacifism, but in the final decades of his life he became the leading figure in the antinuclear weapons movement. From 1950 to his death Russell was extremely active in political campaigning. He established the Bertrand Russell Peace Foundation in 1964, supported the Jews in Russia and the Arabs in Palestine and condemned the Vietnam War. In his family life Russell had his own tragedies : his son John and his grand daughters Sarah and Lucy suffered from schizophrenia. Russell turned over the care of John to his mother Dora. Lucy killed herself five years after Russell's death.

Retaining his ability to cause debate, Russell was imprisoned in 1961 with his fourth and final wife Edith Finch for taking part in a demonstration in Whitehall. The sentence was reduced on medical grounds to seven days in Brixton Prison. His last years Russell spent in North Wales. His later works include HUMAN KNOWLEDGE : ITS SCOPE AND LIMITS (1948), two collections of sardonic fables, SATAN IN THE SUBURB (1953) and NIGHTMARES OF EMINENT PERSONS (1954), and THE AUTOBIOGRAPHY OF BERTRAND RUSSELL (1967-69, 3 vols.), in which he stated : "Three passions, simple but overwhelmingly strong, have governed my life : the longing for love, the search for knowledge and unbearable pity for the suffering of mankind." Russell died of influenza on February 2, 1970. When asked what he would say to God if he found himself before Him, Russell answered : 'I should reproach him for not giving us enough evidence.'

Though Russell was a pioneer of logical positivism, which was further developed by such philosophers from the 'Vienna circle' as Ludwig Wittgenstein and Rudolf Carnap, he never identified himself fully with the group. "The stuff of which the world of our experience is composed is, in my belief, neither mind nor matter," he wrote in *The Analysis of Mind,* "but something more

primitive than either. Both mind and matter seem to be composite, and the stuff of which they are compounded lies in a sense between the two, in a sense above them both, like a common ancestor." In *Human Knowledge : Its Scope and Limits* Russell argued that while the data of sense are mental, they are caused by physical events. The world is a vast collection of facts and events, but beyond the laws of their occurrence science cannot go, it only gives us knowledge of the world.

For further reading :

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- *Bertrand Russell and the Pacifists in the First World War by J. Vellacott (1981);*
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- *Bertrand Russell by C.Moorehead (1992)*
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- *Bertrand Russell : The Spirit of Solitude 1872-1921 by Ray Monk (1996);*
- *Life of Bertrand Russell by Ray Monk (1996) Bertrand Russell : The Ghost of Madness, 1921-1970 by Ray Monk (2000)* - ***Note : Ludwig Wittgenstein*** (1889-1951) sent his first work Tractatus Logico-Philosophicus to Russell from Italy in 1918, where he had been taken prisoner on the front of World War - I. Wittgenstein succeeded in 1939 G.E. Moore as professor of mental philosophy and logic in Cambridge, but resigned in 1947 and the Finnish philosopher Georg Henrik von Wright was invited to succeed Wittgenstein.

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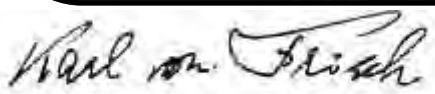
Now, old & near my end,
I have known you,
And, knowing you,
I have found both ecstasy & peace
I know rest,
After so many lonely years
I know what life & love may be
Now, if I sleep,
I shall sleep fulfilled.

Bertrand Russell

Kalinga Laureate for Popularization of Science - 1958

Karl von Frisch, F.R. Germany
Nobel Prize for Physiology or Medicine - 1973



[Born : 20th November, 1886 Vienna, Austria
Died : 12th June, 1982 Munich, West Germany]

Truly Amazing Bees

"Few animals are more amazing than honeybees. They live in an intricate society, with queens, guards, builders, cleaners, nurses, heating and cooling technicians, scouts, honey makers, pollen stampers and collectors of nectar, pollen, water, and resin (each worker bee goes through many different "jobs" during her lifetime). They build complex hives with beautiful honeycombs or perfect hexagons. They make flowering plants and honey-lovers thrive. They accomplish great feats of navigation. They see more colors and smell more scents than we do. They see the polarization pattern in the sky. And they communicate information in a symbolic language without match in the animal kingdon : the bee dance."

— Karl von Frisch

Karl von Frisch - Biography

Zoologist whose studies of communication among bees added significantly to the knowledge of the chemical and visual sensors of insects. He shared the 1973 Nobel Prize for Physiology or Medicine with animal behaviourists Konrad Lorenz and Nikolaas Tinbergen.

Frisch received a Ph.D. from the University of Munich in 1910. He was appointed director of the Zoological Institution of the University of Rostock in 1921, and in 1923 he accepted a similar position at the University of Breslau. In 1925 Frisch returned to the University of Munich, where he established the Zoological Institution. When this institution was destroyed during World War II, he joined the staff of the University of Graz in Austria, but he returned to Munich in 1950, remaining there until his retirement in 1958.

About 1910 Frisch initiated a study that proved fishes could distinguish colour and brightness differences. He also later proved that auditory acuity and sound-distinguishing ability in fishes is superior to that in humans.

Frisch is best known for his studies of bees, however. In 1919 he demonstrated that they can be trained to distinguish between various tastes and odours. He found that while their sense of smell is similar to that of humans, their sense of taste is not as highly developed. He also observed that it is not limited to the quality of sweetness. He found that bees communicate the distance and direction of a food supply to other members of the colony by two types of rhythmic movements or dances : circling and wagging. The circling dance indicates that food is within 75 m (about 250 feet) of the hive, while the wagging dance indicates a greater distance. In 1949 Frisch established that bees, through their perception of polarized light, use the Sun as a compass. He also found that they are capable of using this method of orientation when the Sun is not visible, apparently remembering patterns of polarization presented by the sky at different times of the day and the location of previously encountered landmarks.

Karl knight of freshness (20 November, 1886 in Vienna - 12 June 1982 in Munich) was long time professor for Zoology in Munich and is considered as one of the most important German-speaking behavior researchers. In the center of his work the study of the sensory perceptions of the honey bee and the way of the communication of these animals was located among themselves. For his achievements he was honoured in 1973 together with Konrad Lorenz and Nikolaas Tinbergen with the Nobel Prize for Physiology or Medicine. With the honor “his discoveries were appreciated for the organization and release by individual and social behavior patterns”.

Life :

Karl von Frisch studied Medicine in Vienna and Munich first and only later turned to natural sciences and obtained a doctorate in 1910. In the same year he joined as an assistant to zoo-logical Institute of the University of Munich, where in 1912, he became private lecturer in Zoology and Comparative Anatomy. In 1919 he became Professor. In 1921, he became full professor for Zoology and director of Institute to the University of Rostock. In 1923, he followed a call after Breslau, returned then however in 1925 to the University of Munich, where he took over the line of the zoo-logical institute. After destruction of the zoo-logical

institute in the Second World War he went in 1946 to the Karl Franzens university Graz, until he returned in 1950 to reopening residents of Munich of the institute there. In addition, in 1958 he was Emeritus Professor and continued in the future his scientific research.

In 1962 he received the Balzan Prize for biology.

Karl von Frisch married Margarete, geb. Mohr; his son, Dr. Otto von Frisch, was director of the national nature-historical museum Braunschweig from 1977-1995 and Praesentator of the 1970er-Fernsehserie of "Paradiese of the animals".

Research Results :

Karl von Frisch examined the smell and sense of taste of the western honey bee. He found out that bees can differentiate between different flowering plants at the smell. Their sensitivity for the geschmacksrichtung is sweetly less high surprisingly then with humans.

Karl von Frisch was the son of a University Professor Anton von Frisch. He displayed at early interest in animals, which his family encouraged. His uncle, Sigmund, Exner, the leading authority on insect vision at the time, channeled Frisch's earliest Professional endeavors in to a study of vision in honeybees.

The vision of the bees for forms is human seeing strongly to support, it is however by a high temporal resolving power particularly good able to notice movements. Their color seeing differs from that of humans, since their eye cannot notice the color red, on the other hand however had color sensory cells for the basic colours yellow, blue and ultraviolets. Several blooms, which appear to humans in the same yellow, can appear differently colored for bees because of the different ultraviolet portion.

The investigations are important over the sense of orientation of the bees. Karl von Frisch found out that bees can keep exact directions, whereby they can use the sun as compass even if her are not visible. Owing to the special structure of the bee eye they are able to notice polarized light. From scattered light in the blue sky results there a characteristic sample of partly polarized light not visible for humans, which is dependent on the conditions of the sun. Each place at the sky exhibits a certain percentage of the polarization of the light and a certain oscillation level of the polarization. Only if one piece of blue sky is visible, the bee at the there visible sample can, even if the sun is covered by clouds, which recognize exact position of the sun and orient themselves to it. The bee had besides an internal clock knows it from a trip in the morning the direction of a fodder place, finds it its direction on the basis the position of the sun also in the afternoon, by considering the movement of the sun correcting.

Realizations over found fodder places can be passed on from bee to bee. For this a special dance as communication medium, which arises in two forms, serves. A round dance serves as information that the fodder place (without indication of direction) is in the closer periphery of the bienenstocks, approximately in the distance of 50 to 100 meters. Through close contact of the bees thereby also information about the kind will hand over to the source of food (bloom smell). For information about more distant sources of food however the Schwaenzeltanz is used. The dancing bee on the perpendicularly hanging honeycomb in the bienenstock moves a piece straightforward, runs back then in the semi-circle to the starting point, runs out the same distance again straight and describes then a semi-circle to the other side, on which the dance begins again from the front. On the straight distance the bee with the abdomen implements schwaenzelnde movements. The direction, in which the straight distance will go through, contains the information about the direction of the source of fodder. The angle, which the straight distance forms to senkrechten, indicates exactly the angle, which the indicated flight direction with the conditions of the sum forms. The distance of the source of fodder is communicated to the straight distance per time unit by the speed of the dance, thus by the number of the runs. The other bees take up the information, by keeping close contact during the dance to the

dancing bee and reconstructing their movements. They receive information about the kind of bloom which can be found also about the sense of smell. Also in such a way received direction codes are converted with a trip at later time of day position of the sun changed by the bee depending upon. Orientation works in all other respects so well that the bees find a source of fodder with the help of the Schwaenzeltanzes if they must fly a detour because of an obstacle, about a mountain lying between them.

Karl von Frisch in all other respects found out that bees can notice the direction of the magnetic field of the earth. They use this ability, by always aligning the building of their honeycombs in the dark bienenstock in the same direction to the magnetic field.

Karl von Frisch was obvious much to bring the results of his research also to the laymen. Thus developed the books "dance language and orientation of the bees" and - with newer research results - "from the life of the bees".

Literature :

As his most important work Karl von Frisch regarded :

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Karl knight of freshly medal :

The 'Karl knight of freshly medal" is a Science Prize of the German zoo-logical society (DZG). The Prize is lent in the 2-jaehrigen rotation at scientists, whose work is characterised by outstanding zoo-logical achievements, which represent an integration of the realizations of several biological single disciplines. It is the most important prize of the Zoology in Germany and is endowed with 10.000 euro.

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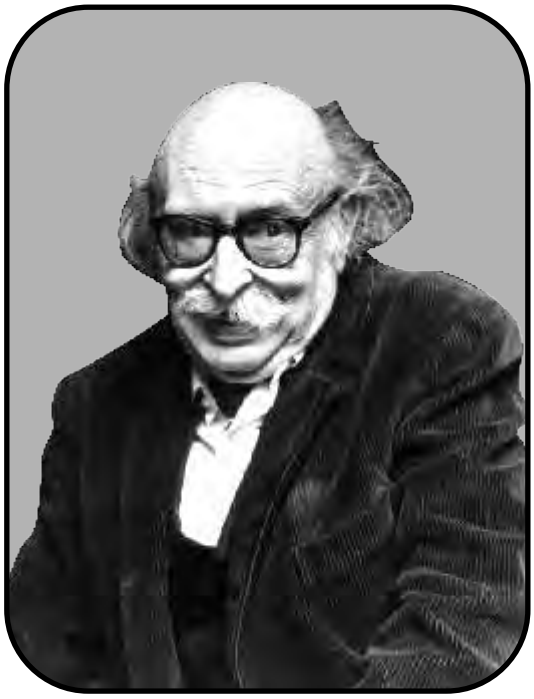
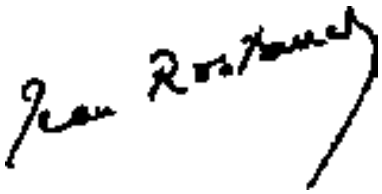
Kalinga Laureate for Popularization of Science - 1959

Mr. Jean Rostand, France





[Born : 30t h October, 1894, Paris
Died : 4th September, 1977, City - in Avray]

Lampoonist, Moralist, Historian of the Life Sciences, Biologist, Popularizer Scientific, Pacifist, Humanistic, Anticlerical... Jean Rostand (1894-1977) was all that. Let us add that he was also Free Thinker (and even Honorary President of the Free Thinking) and that, throughout his existence devoted to the Research of the Truth, he made watch of an Intellectual Honesty out of the common run and of an exceptional Broadmindedness. One can regard as greatest wise XXe century this man who was never proof of least sectarianism.

BIOGRAPHY OF JEAN ROSTAND

Artist, Biologist, Writer, Scientist & Philosopher

Jean Rostand - Biologist, Historian of Sciences, Philosophize, Essayist

Jean Rostand was wire of the playwright Edmond Rostand, Member of the French Academy. He was attracted towards sciences more than towards the letters, although endowed with an excellent feather, he obtained his science degree and, being discovered a true passion for biology, he worked during the First World War in the laboratory of professor Vincent on the vaccine antithyphic.

He has taken part in 1936 with creation of section of biology with Palate of Discovery, he organized with City of Avray his own laboratory, where he must himself devote on the Amphibian with some many research, concerning in particular with field of parthenogenesis and of gynogenèse, where he made some significant discoveries.

He is the author of an exceptionally abundant scientific work which includes/understands: *Chromosomes, craftsmen of heredity and the sex, Of the fly to the man, Formation to be it, State present of the transformism, Evolution of the species, Of the germ to the new-born baby, life of the clamping plates, Problems of heredity and the sex, the new-born baby to the adult, Of the adult to the oldman, life of the dragonflies, New Biology, parthenogenesis of vertebrate, Biology and medicine, Heredity and Racism, life and its prophets, bridal Manners of the animals, Science and Generation, the Man, new Ideas of the genetics, Genesis of the life, life of history of biology, the Future of biology, the animal Parthenogenesis, Biology and the human Future, the Origins of animal biology and the Spallanzani abbot, the Large currents of biology, the Genetics of the batrachians, human Heredity, To inform on the man, the Life this adventure, the Clamping plates, Frogs and some major biological problems, Can one modify the man ?, The Atomism in biology, false Science and distort sciences, Pensèes of a biologist, Nouvelles thoughts of a biologist.*

Picturesque figure but by certain sides brilliant of the scientific world, Jean Rostand could be essential like a researcher original and independent of a great independence of mind, in margin of the university and official circuits to which he preferred his studious retirement of Town of Avray. He could be a writer of talent when he was devoted, out of science, with his taste for the letters. One for this reason owes him several novels and tests, among which the future will retain especially *Pages of a moralist.* It is the moralist who he was more and more, when he advanced in age.

After a first white election, May 22, 1958, in full political crisis, where he obtained only 18 votes against the Charpentier barristers president with the armchair of Claude Farrère, Jean Rostand was elected with the French Academy on April 16, 1959, by 17 votes with the armchair of Édouard Herriot. He was accepted on November 12, 1959 by Jules Romains.

Died on September 4, 1977.

DETILED BIOGRAPHY :

Active as an experimental biologist, Rostand became famous for his work as a science writer, as well as philosopher and activist. His scientific work covered a variety of biological fields such as amphibian embryology, parthenogenesis and teratogeny, while his literary output extended into popular science, history of science and philosophy.

He was the son of playwright Edmond Rostand and poetess Rosemonde Gérard.

Following the footsteps of his father, Rostand was elected to the prestigious Académie française in 1959.

Rostand was a dynamic activist in several causes, in particular against nuclear proliferation and the death penalty. An agnostic, he demonstrated deep humanist convictions. He wrote several books on the question of eugenism and the responsibilities of mankind regarding its own fate and its place in nature.

He married Andrée Mante in 1920. His son François was born the next year.

Selected works :

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- De la vanité et de quelques autres sujets, **1925-Of vanity and several other subjects**
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- L'Évolution des espèces, **1932-The evolution of species.**
- Les problèmes de l'hérédité et du sexe, **1933-The problems of heredity and sex**
- L'aventure humaine, **1933-The human adventure**
- La vie des libellules, **1935-The life of dragonflies**
- Insectes, **1936-Insects**
- La nouvelle biologie, **1937-The new biology**
- Biologie et médecine, **1938-Biology and medicine**
- Hérédité et racisme, 1**938-Heredity and racism**
- Pensée d'un biologiste, **1938-Thoughts from a biologist**
- La vie et ses problèmes, **1938-Life and its problems**
- Science et génération, **1940-Science and generation**
- Les idées nouvelles de la génétique, **1941-New ideas in genetics**
- L' Homme, introduction a l' étude de la biologie humaine, **1941-Man, introduction to the study of human biology**
- L' Homme, maitre de la vie, **1941-Man, master of life**
- Hommes de vérité **,** **1942-Men of truth**
- L' avenir de la biologie, **1943-The future of biology**
- La genèse de la vie, historie des idées sur la génération spontanèe, **1943-Genesis of life, a history of the ideas on spontaneous generation**
- La vie des vers à soie, **1944-The life of silkworms**
- Esquisse d'une histoire de la biologie, **1945-Sketch of a history of biology**

- L' avenir de la biologie,
  1946-The future of biology
- Qu'est-ce qu'un enfant ?,
  1946-What is a child ?
- **Chales Darwin, 1947**
- Nouvelles pensées d'un biologiste,
  1947-New thoughts from a biologist
- L'hèrèditè humaine,
  1948-Human heredity
- Hommes de vèritè II,
  1948-Men of truth II
- La biologie et l' avenir humain,
  1949-Biology and the human future
- L' Homme devant la biologie,
  1949- Man facing biology
- La parthénogenèse, reproduction virginale chez les animaux,
  1949-Parthenogenesis, virginal reproduction in animals
- La parthénogenèse animale,
  1949-Animal parthenogenesis
- La gènètique des batraciens,
  1951-Batracian genetics
- Les grands courants de la biologie,
  1951-Great trends in biology
- Les origines de la biologie expèrimentale et l' abbè Spallanzani,
  1951-The origins of experimental biology and the abbott Spallanzani
- L' hèrèditè humaine,
  1952-Human heredity
- Pages d'un moraliste,
  1952-Pages by a moralist
- Ce que nous apprennent less crapauds et les grenouilles,
  1953-What toads and frogs teach us
- La vie, cette aventure,
  1953-Life, that adventure
- Ce que je crois,
  1953-What I believe
- Instruire sur l' Homme,
  1953-To instruct on Man
- Notes d'un biologiste,
  1954-Notes from a biologist
- Les crapauds et les grenouilles et quelques grands problèmes biologiques,
  1955-Toads, frogs and a few great problems in biology
- Le problème biologique de l'individu,
  1955-The biological problem of the individual
- L' Homme en l'an 2000,
  1956-Man in the year 2000
- Peut-on modifier l' Homme ?,
  1956-Can we modify Man ?
- L'atomisme en biologie,
  1956-Atomism in biology
- Bestiaire d' amour,
  1958-A bestiary of love
- Aux sources de la biologie,
  1958-At the sources of biology
- Anomalies des amphibiens anoures,
  1958-Anomalies of anurian amphibians
- Science fausse et fausses science,
  1958 - Erroneous science and false science.
- Les origines de la biologie experimentale,
  1959-Origins of experimental biology
- Carnet d'un biologiste,
  1959-Notepad of a biologist
- Espoirs et inquiétudes de l' homme,
  1959-The hopes and worries of Man.

" INDEPENDENCE OF The MIND, RESPECT OF The MAN, LOVE OF TRUTH...

THAT ONE DOES NOT AWAIT EGO THAT, CLOSE COMPLETING Me, I DISAVOW The FEW IDEAS OF WHICH I LIVED A1. "

Kalinga Laureate for Popularization of Science - 1960

Professor Peter Ritchie Calder, United Kingdom

[Born : 1906, Forfar, Angus
Died : 1982, Edinburgh]

"A great discovery depends on three things-The Method-The Man-The Moment. If the Man does not have the method, he will miss the moment."

Prof Ritchie Calder in Science in our Lives (1962)

Biography of Professor Ritchie Calder

Journalist and educationist, born in Forfar, Angus, E. Scotland, UK. Specializing in the spread of scientific knowledge to lay readers, he wrote numerous books including Men Against the Desert (1951),MEN AGAINST THE JUNGLE(1954) Living with the Atom (1962), and The Evolution of the Machine (1968). He was made a life peer in 1966.

Peter Ritchie Calder, Baron Ritchie-Calder of Balmashanner (1906) Forfar, Angus - 1982, Edinburgh) was a noted Scottish author, journalist and academic.

Calder first worked as a journalist in Dundee and Glasgow where he became noted as a socialist and pacifist.

After moving to London before World War II, he accepted an appointment as the Director of Plans and Campaigns at the Political Warfare Executive branch of the Government, whichf was responsible for the allied war propaganda effort. He wrote propaganda posters and leaflets and speeches for allied leaders. He was a member of the 1941 Committee, a group of liberal politicians, writers and other people of influence in the United Kingdom. In 1941 he became popular with his book Carry on London, which described the effects of the German bombardment of London, Coventry and other cities in Great Britain.

After the war Calder returned to his former activities as a writer and specialised in internationalism, the peace movement and in the public understanding of science. He worked also with the United Nations and was the President of the British Peace Council and of the Campaign for Nuclear Disarmament. Calder was an ardent pacifist and humanist. In 1980 he was one of the signatories of the A Secular Humanist Declaration, a statement of belief in Democratic, Secular. Humanism, issued by The Council for Democratic and Secular Humanism(“CODESH”), now the Council for Secular Humanism (“CSH”).

He also taught International Relations at the University of Edinburgh, from 1961 to 1967. He was created a life peer in 1966 and received the 1960 Kalinga prize.

Lord Richtie-Calder is the father of science writer Nigel Calder (b.d1931) and also writer and historian Angus Calder (b.1942). He is also the grandfather of travel writer Simon Calder.

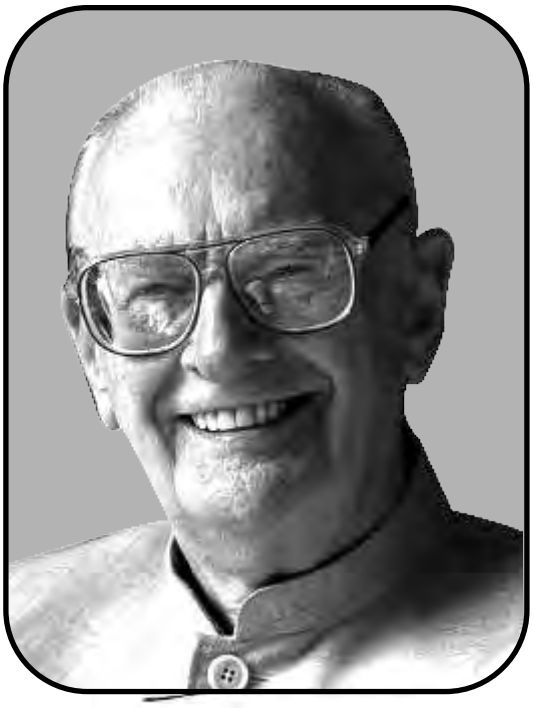
WORKS

- Carry On London (1941)
- Living with the Atom
- Born of the Wilderness
- Men Against the Jungle
- Men Against the Desert
- Medicine and Men
- Profile in Science
- Man and the Cosmos
- After the Seventh Day
- The Future of a Troubled World
- The HJond of Life
- Science in our lives
- The Wonderful World of Medicine
- Leonardo
- The Inheritors: The Story of Man and the World he Made
- The Pollution of the Mediterranean Sea
- Science and Socialism
- West Meets East
- Dawn Over Asia
- The Birth of the Future
- Man and His Environment
- Hurtling Toward 2000 A.D.
- A Home Called Earth
- Science in Israel

For a non-careerist and yet fulfilling and exciting life, Calder had his father as an exemplar. Son of Dundee Jute workers, Peter Ritchie Calder became a resourceful Fleet Street journalist, science writer; UN emissary; professor of International relations at Edinburgh University, which awarded him an honorary MA to "make him legitimate", for he had no degree; life per, as Lord Ritchie-Calder of Balmashannar; advisor on science to the Encyclopedia Britannica; co-founder of the Campaign for Nuclear Disarmament.

Kalinga Laureate for Popularization of Science -1961

Dr. Arthur C. Clarke, United Kingdom



[Born : 16th December, 1917, Minehead, Somerset, UK
Died : 18th March, 2008, Sri Lanka]

Arthur C. Clarke's Laws

Clarke's First Law :

"When a distinguished but elderly scientist states that something is possible he is almost certainly right. When he states that something is impossible, he is very probably wrong."

Clarke's Second Law :

"The only way of discovering the limits of the possible is to venture a little way past them into the impossible."

Clarke's Third Law:

"Any sufficiently advanced technology is indistinguishable from magic"

Arthur Charles Clarke, CBE - Detailed Biography

Author and scientist Sir Arthur C. Clarke was born in Minehead, Somerset, England on December 16,1917, and attended Huish's Grammar School in Taunton, 1927-36. Then in 1936 he moved to London, where he joined the British Interplanetary Society. There he started to experiment with astronautic material and write the BIS Bulletin, as well as science fiction stories.

During World War II, as an RAF officer, he was in charge of the first radar talk-down equipment, the Ground Controlled Approach, during its experimental trials. His only non-science-fiction novel, Glide Path, is based on this work.

In 1945, Dr. Clarke published the technical paper "Extra Terrestrical Relays", which presented the principles of satellite communication from satellites in geostationary orbits. This revolutionary concept was realized some 25 years later and brought him numerous honors, such as the 1982 Marconi International Fellowship , a gold medal of the Franklin Institute, the Vikram Sarabhai Professorship of the Physical Research Laboratory in Ahmedabad, the Lindbergh Award and a Fellowship of King's College, London. Today, the geostationary orbit at 42,000 kilometers is named The Clarke Orbit by the International Astronomical Union.

After the war, Dr. Clarke returned to London and to the BIS, over which he presided in 1946-47 and 1950-53. He obtained first class honors in Physics and Mathematics at King's College in 1948.

In 1954, Dr. Clarke wrote to Dr.Harry Wexler, then chief of the Scientific Services Division, U.S. Weather Bureau, about satellite applications for weather forecasting . Of these communications, a new branch of meteorology was born. Dr. Wexler became the driving force for the use of rockets and satellites for meteorological research and operations.

A love of diving and coral reef systems took Sir Arthur to Colombo, Sri Lanka, in December 1954, and there he has lived since 1956. He was the first non-citizen to be granted "Resident Guest" status 1975. He is there still, living with his adopted family and involved in as many as 80 projects simultaneously , including his continuing works of science fiction, for which he is most well known . This in itself would be a remarkable achievement for any man, let alone a man approaching 90 years of age who considers himself fortunate to be suffering from post polio syndrome (most people don't survive the polio, he reminds us).

On 26 May 2000, Dr. Clarke was presented the "Award of Knight Bachelor" at a ceremony in Colombo, two years after the title was conferred on him.

Sir Arthur Clarke is the author of many books and has participated in the production of a variety of films about space. The first story Clarke sold professionally was "Rescue Party", written in March 1945 and appearing in Astounding Science in May 1946 . In 1964, he started to work with Stanley Kubrick on a novel and movie script for the "definitive science fiction story". Four years later, he shared an Oscar Academy Award nomination with Mr. Kubrick for the film version of 2001: A Space Odyssey . Sir Arthur subsequently co-broadcasted the Apollo 12 and 15 missions with Walter Cronkite and Wally Schirra for CBS. In 1985 he published a sequel to 2001, 2010: Odyssey Two, and worked with Peter Hyams on the movie version. His thirteen-part TV series Arthur C. Clarke's Mysterious World in 1981 and Arthur C.Clarke's World of Strange Powers in 1984 has now been screened in many countries. Morgan Freeman and movie company Digital Revelations are currently making a version of the novel Rendezvous with Rama, and actress Hilary Swank has bought the movie rights to make

Childhoods End, showing the endless appeal of Sir Arthur's Work.

Below is a mostly complete list of his honours and achievements.

Affiliations :

- Chancellor, International Space University (1989-
- Chancellor, University of Moratuwa, Sri Lanka (1979-
- Chairman, British Interplanetary Society 1947-50, 1953.
- Hon. Chairman, Society of Satellite Professionals
- President, British Science Fiction Association
- Life Member: Assn. of British Science Writers
- Hon. Vice President, H.G. Wells Society

Patron:

- Arthur Clarke Centre for Modern Technologies, Sri Lanka
- Sri Lanka Assn.for the Advancement of Science
- Sri Lanka Astronomical Association
- Sri Lanka Animal Welfare Association
- Science Fiction Foundation
- British Sub Aqua-Club
- National Institute for Paraplegics, Sri Lanka

Council Member:

- Society of Authors

Advisory Council:

- International Science Policy Foundation
- Fauna International (Sri Lanka)
- Earth Trust

Board Member :

- National Space Society (USA)
- Space Generation Foundation (USA)
- IAU (SETI) Commission 51
- The Planetary Society (USA)
- Lindbergh Award Nominations Committee (USA)

Trustee:

- Institute of Integral Education (Sri Lanka)
- Society Memberships:

Fellow:

- Royal Astronomical Society
- Royal Society of Arts

Member:

- Royal Asiatic Society
- British Astronomical Association
- Science Fiction Writers of America
- Astronomical Society of the Pacific

Director:

- Rocket Publishing Company (UK)
- Underwater Safaris (Sri Lanka)

Awards and Honours:

- ® CBE (Queen's Birthday Honours List, 1989)
- British Interplanetary Society, Hon. Fellow
- American Astronautical Asociation, Hon, Fellow
- World Academy of Art & Science, Academician
- International Academy of Astronautics, Hon. Fellow 1960
- Franklin Institute Stuart Ballantine Gold Medal 1963
- Franklin Institute, Fellow 1971
- Beaver College, Pennsylvania, Hon. D.Sc 1971
- AIAA Aerospace Communications Award, 1974
- AIAA Hon. Fellow, 1976
- Boston Museum of Science, Bradford Washburn Award, 1977
- King's College, London, Fellow 1977
- University of Moratuwa, Hon. D.Sc., 1979
- Academy of Television Arts & Sciences Engineering Award, 1981
- Fellow, Institute of Robotics, Carnegie-Mellon, 1981
- Marconi International Fellowship, 1982
- Hon. Fellow, Instn. of Engineers, Sri Lanks, 1983

- IEEE Centennial Medal, 1984
- National Academy of Engineering (USA) Foreign Associate 1986
- Vidya Jyothi Medal (Presidential Science Award) 1986
- Charles A Lindbergh Award, 1987
- Third World Academy of Sciences, Associate Fellow, 1987
- Society of Satellite Professionals: Hall of Fame, 1987
- University of Bath, D. Litt., 1988
- Fellow, Intnl. Aerospace Hall of Fame, San Diego, CA, 1989
- Fellow, Intnl. Space Hall of Fame, Alamagordo, NM 1989
- Special Achievement Award, Space Explorers Assn., Riyadh 1989
- Hon. Life President, U.N. Association of Sri Lanka, 1990
- Hon. Fellow, Ceylon College of Physicians, 1991
- Internal Science Policy Foundation Medal , 1992
- Lord Perry Award, 1992
- NASA Distinguished Public Service Medal, 1995
- Nominated for Nobel Peace Prize , 1994
- International Fantasy Award, 1952
- HUGO (World Science Fiction Convention) 1956, 1974, 1980
- NEBULA (SF Writers of America) 1973, 1974, 1979
- **UNESCO-Kalinga Prize, 1961**
- Aviation Space-Writer's Assn. Robert Ball Award, 1965
- AAAS-Westinghouse Science Writing Prize, 1969
- OSCAR Nomination for "2001" screenplay (with Stanley Kubrick), 1969
- PLAYBOY Editorial Awad, 1971, 1982
- John W. Campbell Award, 1974
- GALAXY Award, 1979
- E.M. Emme Astronautical Literature Award (AAS), 1984
- SF Writers of America "Grand Master," 1986 Below is a Bibliography of Sir Arthur's work-he's been quite busy.

Series :

Space Odysey

1. 2001: A Space Odyssey (1968)
2. 2010:Odyssey Two (1982)
3. 2061:Odyssey Three (1985)
4. 3001: The Final Odyssey (1996)

Rama :

1. Rendezvous with Rama (1972)
2. Rama II (1989) (with Gentry Lee)
3. The Garden of Rama (1991) (with Gentry Lee)
4. Rama Revealed (1993) (with Gentry Lee)

Time Odyssey (with Stephen M Baxter) :

1. Time's Eye (2003)

Novels :

- Prelude to Space (1951)
- Sands of Mars (1951)
- Islands in the Sky (1952)
- Against the Fall of the Night (1953)
- Childhoos' End (1953)
- The Deep Range (1954)
- Earthlight (1955)
- The City and the Stars (1956)
- Reefs of Taprobane (1957)
- A Fall of Moondust (1961)
- Master of Space (1961)
- Dolphin Island: A Story of the People of the Sea (1963)
- Glide Path (1963)
- The Space Dreamers (1969)
- Imperial Earth (1975)
- The View from Serendip (1977)
- The Fountains of Paradise (1978)
- Cradle (1987) (with Gentry Lee)
- Beyond the Fall of Night (1990) (with Gregory Benford)
- The Ghost from the Grand Banks (1990)
- The Hanmmer of God (1993)
- Breaking Strain : The Adventures of Yellow Dog (1995)
- Richter 10 (1996) (with Mike McQuay)

- The Trigger (1999) (with Michael P Kube-McDowell)
- The Light of Other Days (2000) (with Stephen M Baxter)
- The Last Theorem (2004)

Collections :

- Tales from the White Hart (1940)
- Expedition to Earth (1953)
- Reach for Tomorrow (1956)
- The Other side of the Sky (1958)
- Across the Sea of Stars (1959)
- From the Ocean, From the Stars (omnibus) (1962)
- Tales of Ten Worlds (1962)
- Aka Tales from the Ten Worlds (1962)
- Prelude to Mars (omnibus) (1965)
- The Nine Billion Names of God (1967)
- An Arthur C. Clarke second omnibus (omnibus) (1968)
- The Lion of Comarre: And Other Stories (1968)
- Earthlight And Other Stories (1971)
- Of Time and Stars (1972)
- The Wind from the Sun (1972)
- The Best of Arthur C Clarke 1937-1955 (1973)
- The Best of Arthur C. Clarke (1973)
- Best of Arthur C. Clarke: 1956-1972 (1977)
- Four Great SF Novels (1978)
- Possessed: And Other Stories (1978)
- Arthur C. Clarke: 2001, A Space Odyssey; The City and the Stars; The Deep Range, A Fall of Moondust; Rendezvous with Rama (1980)
- The Sentinel (1982)
- Lion of Comarre and Against the Fall of Night (1983)
- The Songs of Distant Earth: And Other Stories (1986)
- The Best Short Stories of Arthur C. Clarke (1988)
- Tales from Planet Eath (1989)
- A Meeting with Medusa: And Other Stories (1990)
- The Arthur C. Clarke Collection : 2001 a Space Odyssey / Transit of Earth/Fountains of Paradise/Childhood's End (ABRIDGED) (1995)
- The City and the Stars / The Sands of Mars (omnibus) (2001)
- The Collected Stories of Arthur C. Clarke (2001)
- The Ghost from the Grand Banks and the Deep Range (2001)
- The Shining Ones: And Other Stories (2001)
- Space Trilogy (omnibus) (2001)

Anthologies Edited :

- Time Probe : The Sciences in Science Fiction (1967)
- Three for Tomorrow (1970)
- The Science Fiction Hall of Fame Volume Four (1981) (with George W Proctor)
- Project Solar Sail (1986)
- Hal's Legacy (1996) (with David G Stork)

Non Fiction Series :

Blue Planet

1. The Coast of Coral (1956)
2. The Treasure of the Great Reef (1964)

Non Fiction :

- Interplanetary Flight (1950)
- The Exploration of Space (1951)
- The Exploration of the Moon (1954)
- The Young Traveller in Space (1954)
- Aka Going Into Space (1954)
- The Making of a Moon (1957)
- Boy Beneath the Sea (1958)
- The Challenge of the Spaceship (1958)
- Voice Across the Sea (1958)
- The Challenge of the Sea (1960)
- The First Five Fathoms (1960)
- Indian Ocean Adventure (1961)
- Profiles of the Future (1962)
- Indian Ocean Treasure (1964) (with Mike Wilson)

- Voices from the Sky (1965)
- The Coming of the space Age (1967)
- Man and Space: Life Science Library (1967)
- 2001: Filming the Future (1968) (with Piers Bizony)
- The Promise of Space (1968)
- First on the Moon (1970)
- Into Space (1971) (with Robert Silverberg)
- Beyond Jupiter (1972) (with Chesley Bonestell)
- The Lost Worlds of 2001 (1972)
- Report on Planet Three: And Other Speculations (1972)
- 2001 and Beyond (1975)
- Technology and the Frontiers of Knowledge (1975)
- Mysterious Worlds (1980)
- Arthur C. Clarke's Mysterious World (1981) (with John Fairly and Simon Welfare)
- Arthur C. Clarke's World of Strange Powers (1981) (with John Fairly)
- 1984 Spring: A Choice of Futures (1984)
- Frontline of Discovery : Science on the Brink of Tomorrow (1985)
- More than one Universe (1985)
- The Odyssey File (1985) (with Peter Hyams)
- Arthur C. Clarke's July 20,2019: Life in the 21st Century (1986)
- Astounding Days: A Science Fictional Autobiography (1988)
- How the World Was one: Beyond the Global Village (1988)
- The Worlds of Galileo (1988)
- Arthur C. Clarke's chronicles of the strange and mysterious (1989) (with John Fairley)
- An Encyclopedia of Claims, Frauds, and Hoaxes of the Occult and Supernatural: James Randi's Decidedly Skeptical Definitions of Alternate Realities (1992) (with James Randi)
- The Fantastic Muse (1992)
- By Space Possessed (1993)
- The Apollo 11 Moon Landing (1994)
- Arthur C. Clarke's A-Z of Mysteries (1994)
- The Colours of Infinity (1994)
- The Snows of Olympus: A Garden on Mars (1994)
- The Supernatural A-Z (1995) (with James Randi)
- Macroshift : Navigating the Transformation to a Sustainable to World (1997)
- Arthur C. Clarke and Lord Dunsany: A Correspondence (1998) (with Lord Dunsany)
- Arthur C. Clarke's Mysteries (1998) (with John Fairley and Simon Welfare)
- Greetings, Carbon-Based Bipeds! (1999)
- Welcome to the Wired World: The New Networked Economy (1999)
- Sri Lanka:The Emerald Island (2000)
- Arthur C.Clarke and C.S. Lewis: A Correspondence (2001) (with C S Lewis)
- Moonwatcher's Memoir: A Diary of 2001 , a Space Odyssey (2002) (with Dan Richter)
- From Narnia to a Space Odyssey: The War of Letters Between Arthur C. Clarke and C.S. Lewis (2003) (with C S Lewis)

Short Stories :

- Travel By Wire! (1937)
- Retreat from Earth (1938)
- The Awakening (1942)
- Whacky (1942)
- Loophole (1946)
- Rescue Party (1946)
- Technical Error (1946)
- Castaway (1947)
- The Curse (1947)
- The Fires Within (1947) (writing as E G O'Brien)
- Inheritance (1948)
- Breaking Strain (1949)
- The Forgotten Enemy (1949)
- Hide and Seek (1949)
- History Lesson (1949)
- Transcience (1949)
- The Wall of Darkness (1949)
- Guardian Angel (1950)
- Nemesis (1950)
- The Road to the Sea (1950)
- Silence, Please! (1950)
- Time's Arrow (1950)
- A Walk in the Dark (1950)
- Captain Wyxtpthll's Flying Saucer (1951)
- 'If I Forget Thee, Oh Earth…' (1951)
- Second Dawn (1951)
- The Sentinel (1951)
- Sentinel of Eternity (1951)
- Superiority (1951)

- Trouble with the Natives (1951)
- All the Time in the World (1952)
- The Possessed (1952)
- Encounter at Dawn (1953)
- Encounter in the Dawn (1953)
- Expedition to Earth (1953)
- Jupiter V (1953)
- The Nine Billion Names of God (1953)
- The Parasite (1953)
- Armaments Race (1954)
- Big Game Hunt (1954)
- No Morning After (1954)
- Patent Pending (1954)
- Refugee (1955)
- The Star (1955) Hugo
- This Earth of Majesty (1955)
- What Goes Up (1955)
- All that Glitters (1956)
- Green Fingers (1956)
- The Next Tenants (1956)
- What Goes Up (1955)
- All that Glitters (1956)
- Green Fingers (1956)
- The Next Tenants (1956)
- The Pacifist (1956)
- Publicity Campaign (1956)
- A Question of Residence (1956)
- The Reluctant Orchid (1956)
- Robin Hood, FRS (1956)
- The Starting Line (1956)
- The Ultimate Melody (1956)
- Venture to the Moon (1956)
- Watch This Space (1956)
- The Call of the Stars (1957)
- Cold War (1957)
- Critical Mass (1957)
- The Defestration of Ermintrude Inch (1957)
- Feathere)
- Sleeping Beauty (1957)
- The Songs of Distant Earth (1957)
- Special Delivery (1957)
- Take a Deep Breath (1957)
- Cosmic Casanova (1958)
- The Haunted Spacesuit (1958)
- Out of the Sun (1958)
- A Slight Case of Sunstroke (1958)
- Who's There? (1958)
- Out of the Cradle, Endlessly Orbiting .. (1959)
- Crime on Mars (1960)
- I Remember Babylon (1960)
- Into the Comet (1960)
- Summertime on Icarus (1960)
- Trouble with Time (1960)
- Before Eden (1961)
- Death and the Senator (1961)
- Hate (1961)
- Saturn Rising (1961)
- An Ape About the Hoose (1962)
- Dog Star (1962)
- The Secret (1963)
- Sunjammer (1964)
- The Wind from the Sun (1964)
- Dial "F" for Frankenstein (1965)
- The Longest Science-Fiction Story Ever Told (1966)
- A Meeting with Medusa (1971) Nebula
- Hugo (nominee)
- Reunion (1971)
- Transit of Earth (1971)
- Rendezvous with Rama (excerpt) (1973)
- The Steam-Powered Word Processor (1986)
- The Wire Continuum (1998) (with Stephen M Baxter)
- Hibernaculum 46 (2000) (with Stephen M Baxter)

" I now realize that it was my interest in astronautics that led me to the ocean. Both involve exploration, of course-but that's not the only reason. When the first skin-diving equipment started to appear in the late 1940s, I suddenly realized that here was a cheap and simple way of imitating one of the most magical aspects of space flight – weightessness."

...Arthur C. Clarke

Kalinga Laureate for Popularization of Science – 1962

Dr. Gerard Piel, USA

[Born : 1st March, 1915, Woodmore, New York
Died : 7th September, 2004, Queens, New York City]

The Most Remarkable Discovery made by Scientists is Science itself

….Gerard Piel.

Science shall occupy the same Place in the mind of every thinking citizen that it occupies as an integral part of our modern civilization

....Gerard Piel

Gerard Piel Biography

Dr. Gerard Piel (1 March, 1915-September 7, 2004) was a pioneer in science journalism. He bought the magazine Scientific American in 1947 and became its chairman in 1980. In 1986 he became the president of the American Assoication for the Advancement of Science (AAAS).

He was born in Woodmere, New York and died in Mount Sinai Hospital in Queens, New York City.

Dr. Piel also wrote for various magazines, including The Nation.

Quote :

"The most remarkable discovery made by scientists is science itself."

Books :

- The Age of Science: What We Learned in the 20th Century
- Science in the Cause of Man
- The Acceleration of History
- Only One World
- The World of Rene Dubos: A Collection of His Writings

Tributes by Scientific American
September 9, 2004

Gerard Piel, Former Publisher and Chairman of Scientific American (1915-2004)

Gerard Piel, the former publisher of Scientific American who helped reinvent this magazine and redefine the modern era of science journalism, died on Sept. 7 at the age of 89. The cause was lingering complications from a stroke he suffered this past February.

Although Piel never formally studied science-he graduated from Harvard magna cum laude as a history major-his influence over science literacy worldwide cannot be overstated. For six years in the 1940s he worked as the science editor at Life magazine, reaching an audience of millions. Then in 1947 he, fellow journalists Dennis Flanagan and Donald H. Miller, and a group of investors purchased Scientific American. That already venerable magazine had published accounts of inventions and discoveries since 1845, but its new owners had more ambitious plans.

Piel as publisher, Flanagan as editor and Miller as general manager remade the magazine into a more sophisticated, authoritative monthly in which the feature articles were routinely written by experts in those subjects, yet were intended for an educated general public instead of a purely professional one. This new formula for Scientific American proved hugely successful, especially in what became the "space race" era of international technological competitiveness, and Piel saw the magazine's readership grow through the 1970s.

Gerard Piel believed strongly that the entire world should participate and share in the benefits of scientific enterprise. For that reason, he aggressively sought partners outside the U.S. to publish Scientific American in other countries and languages. Thanks in part to his initiative, editions of Scientific American are today published in 18 nations. As publisher of Scientific American, Piel became a roving ambassador of good will for science, and he sometimes tapped other staffers of the magazine to join him: longtime employees fondly remember times in the late 1970s when Piel brought the entire staff with him on trips through the then-Soviet Union and China.

For Piel, scientific reason also deserved to be a beacon for political reform and good governance. Throughout the 1970s, for example, the magazine published a string of articles arguing for international nuclear disarmament and a reassessment of the politics of mutually assured destruction.

In 1984 Piel stepped away from his day-to-day duties as publisher and assumed the role of chairman of Scientific American, which he continued to hold for another decade. Nevertheless, he continued to write and speak about science. During this time he authored The Age of Science: What Scientists Learned in the 20th Century (2001) and Only One World (1992) and co-edited The World of Rene Dubos: A Collection of His Writings (1990). (These books joined his earlier works, Science in the Cause of Man (1962) and The Acceleration of History (1972).

In addition, Piel held many other positions of note throughout his career, including president of the American Association for the Advancement of Science and membership on the boards of the American Museum of Natural History, the Henry J. Kaiser Foundation and the Mayo Clinic.
Those of us who had the fortune to have known or met Gerard Piel are saddened now to have lost him. He was a landmark figure in journalistic letters, and he directly promoted the growth of science as much as any one person could. – The Editors.

Tributes by
American Association for the Advancement Science(AAAS)
8 September 2004

Gerard Piel, Former Publisher of Scientific American, Dies at Age 89

Gerard Piel, 89, a past president of AAAS and the publisher best remembered for infusing life into Scientific American, died of complications from a stroke on 7 September at Mount Sinai Hospital in Queens, NY.

Piel virtually invented modern science journalism. He believed that combining the highest standards of science with the best traditions of journalism could enlighten the public. His aim was known to many – that "science shall occupy the same place in the mind of every thinking citizen that it occupies as an integral part of our modern civilization."

Piel was born into a brewing family, Piel Brothers Brewery, on 1 March 1915, in Woodmere, NY. In 1937, he earned his bachelor's degree in history from Harvard University, graduating magna cum laude.

He began his career as an editorial trainee at Time Inc. In his six years at Life Inc., Piel was eventually promoted to science editor for Life magazine. In his 2001 book "The Age of Science," Piel confessed that he had the most unlikely scientific preparation. He was America's foremost nonscientist, acquiring knowledge in many disciplines of science. The New York Times once reported that his history of scientific discovery in the twentieth century was similar to a text for general science.

Piel borrowed money to buy Scientific American in 1947. The publication, established in 1845, had reached a lull in its popularity. Piel took over the periodical just after World War II, made it over, and four years after his purchase, the magazine showed a profit. During his tenure as publisher, circulation topped one million.

In1984, Piel became the chairman of the company, and two years later oversaw the sale of the magazine to Verlagsgruppe Georg von Holtzbrinck, a giant German publishing enterprise and its current publisher.

For 1985-1987, Piel served as AAAS President and Chairman and was the first journalist to head the organization. He presided over the 152nd AAAS Annual Meeting in Philadelphia, PA. Piel was a passionate

advocate for more federal support of science education in primary and secondary schools and felt AAAS should mount a campaign for the national reform of science education.

Apart from his career in publishing, he served as an overseer at Harvard University, a trustee at Radcliff College, and on the boards of Phillips Andover Academy, the Henry J. Kaiser Foundation, the Mayo Clinic, the American Museum of Natural History and the New York Botanical Garden. He also received more than twenty honorary doctorates and numerous awards in the scientific community.

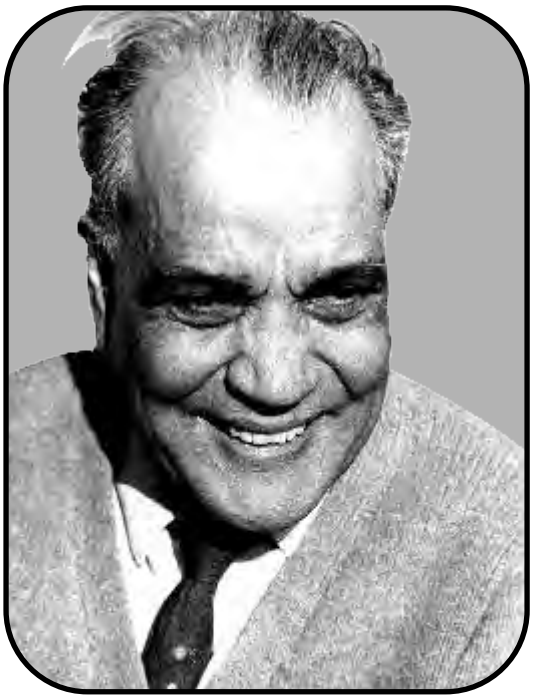
A prolific writer, Piel authored several books, most recently "The Age of Science: What Scientists Learned in the 20th Century" (Basic Books, 2001), Other titles included "Science in the Cause of Man" (Knopf, 1962), "The Acceleration of History" (Knopf, 1972) and "Only One World" (Freeman, 1992). He was co-editor of "The World of Rene Dubos: A Collection of His Writings" (Holt, 1990).

Piel is survived by his wife, Eleanor Jackson Piel, a civil rights attorney; a daughter, Eleanor P. Womack of Califormia; a son, Jonathan B. Piel of Manhattan; 11 grandchildren and two great grandchildren.

- Monica Amarelo
8 September, 2004

Kalinga Laureate for Popularization of Science – 1963

Dr. Jagjit Singh, India



[Born : 15th May, 1912, Amritsar, Punjab, India
Died : 27th September, 2002, New Delhi]

BIOGRAPHICAL NOTE

Jagjit Singh

Jagjit Singh (1912-2002) was an Indian writer and science popularizer. In College he excelled in mathematics courses, yet made his career as an important director of India's railways, applying his mathematical skills there. Upon retirement, he set out in writing several books, starting with *Great Ideas of Modern Mathematics,* popularizing science and targeting laymen. Singh subsequently won the Kalinga Prize in 1963, the first Asian to be so.

In 1960, he was appointed director of the Indian Railway Board, and nine years later he was appointed general manager of the North-East Frontier Railways. After his retirement he went to work as was managing director of the Indian Drugs and Pharmaceuticals, adviser of Asian Development Bank and adviser of Tata Chemicals.

Singh was elected a Fellow of the Royal Statistical Society and awarded an honorary Doctorate in Science by Roorkee University. He was also chosen by Pakistan scientist and Nobel Prize winner in Physics in 1978, Abdus Salam to write his biography.

Works :

- Great Ideas of Modern Mathematics
- Great Ideas and Theories of Modern Cosmology
- Great Ideas in Information Theory, Language and Cybernetics
- Reminiscences of a Mathematician Manqué

References :

Biographical note (http://www.tribuneindia.com/2003/20030208/windows/above.htm)
Retriered from "http ://en.wikipedia.org/wiki Jagjit_Singh_%28 Writer%29"

Jagjit Singh
A Brief Biographical Profile

Jagjit Singh	**:**	Mathematician, Statistician
Born	**:**	Amritsar, India, May 15, 1912,
Son of	**:**	Harcharan Singh & Durga Devi
Equcational Qualification :		
		BA - Govt. College, Lahore, Punjab University 1931
		MA - 1933
		D.Sc. – Honourary, Roorkee Universtiy, 1969.
Wife	**:**	Harbans Kaur – May 7, 1933 (Date of Marriage)
Children	**:**	Raj Bhalla, Jatinder Singh, Rita Mathur.
Service	**:**	Indian Govt. Railways Administrative service, 1936-69
		General Manager , South Eastern Railway 1967-1969
		Chairman, Indian Drugs & Pharmaceutical Ltd(IDPL) 1969-1973
Consutatant	**:**	Asian Dev. Bank 1972, 1973
Joint Secretary :		Indian statistical Institute , 1971-1974,
Vice Chairman:		Indian Statistical Institute , 1974-1976
International Award	**:**	**Recipient of Kalinga Prize , UNESCO –1963**
Fellow	**:**	Royal Statistical Society, Institute of Mathmatical Statistics
Members	**:**	Opertions Research Society India, (Past President)
		Clubs : Calcutta, Delhi Gymkhana
Author	**:**	Mathematical Ideas
		Modern Cosmology
		Operations Research
		Great Ideas of Information Theory
		Language & Cybermetics
		Some Indian Eminent Scientists
		The story of our Railway
		Statistical Aids to Rly Operations
Also	**:**	Research Papers . Editorial Board Science Reporter
Home	**:**	D- 943 New friends colony Mathura Road New Delhi – 110065 , India
Death	**:**	27.9.2002 at 7 pm at New Delhi Resident

Source :
Who's Who in the World
3rd Edition 1976-1977.
Marquis Who's Who
Marquis Who's Who Inc
200 - East Ohio Streat, Chicago,
Illinois, 60611, USA.

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BIO-DATA OF MR. JAGJIT SINGH

Date of Birth : 15th May 1912 at Amritsar in Punjab (India).

Address : D-943 New Friends colony Mathura Road New Delhi-110065 Tel:011-26314015®

Academic Qualification :

(a) M.A. in Mathematics (1933), Punjab University, Lahore (now in Pakistan)

(b) D.Sc. (Hons. Causa), Roorkee University (1968) for outstanding work in science popularization and Operations Research.

(c) Fellow of Royal Statistical Society, London.

(d) Member, Indian Statistical Institute, Calcutta.

(e) Past President of the Operations Research Society of India.

Positions Held :

(a) Joined the Administrative Service of the Indian Government Railways in 1936.

(b) Director, Railway Board, Ministry of Railways 1960-65.

(c) General Manager, North East Frontier Railway 1965-66.

(d) General Manager, South Eastern Railway 1966-69.

(e) Chairman & Managing Director, Indian Drugs & Pharmaceuticals Ltd., A Govt. of India Undertaking and the largest pharmaceutical company in India 1969-73.

(f) Consultant to Asian Development Bank, Manila, for appraising their South Asian Transport Survey (1972).

(g) Chairman, Editorial Board of Science Reporter, a monthly Science popularization magazine published by the Indian Council of Scientific and Industrial Research (1963-65).

(h) Adviser, Operations Research, Govt. of India (1960-65).

(i) Advisor, Scientific Research to Indo-Burmah Petroleum Company 1976-78.

(j) Consultant, to University of Texas, Austin, Oct. 1978-Feb. 1979.

(k) Chairman, Statutory Committee, Indian Statistical Institute 1979-82.

(l) Member, Indian Statistical Institute (ISI). The Second Review Committee 1982-83.

(m) Director, Research, UNDP Project for Regional Cooperation between Bangladesh, Bhutan, Nepal, India, Pakistan and Sri Lanka on develop of Transport and Telecommunication Linkages between these countries (1980-85).

(n) Adviser, Operation Research, Coal India (a Govt. of India Undertaking) (1984-85).

(o) Member, Steering Committee for Transport , PlanningCommission (1985-88).

(p) Member, Steering Group for formulation of Transport Programmes for the Eighth Five Year Plan (1986-90).

(q) Invited by Director, International Centre for Theoretical Physics, Trieste, set up under the auspices of the International Atomic Energy Agency (IAEA) to come to Trieste to write a biography of Abdus Salam, who won Nobel Prize for Physics in 1979. The biography was published by Penguins India (1990-92).

Assignment : Consultant to Tata Chemicals Ltd., Bombay on

EVOP Techniques

Material Handling Systems and Transport Problems

Energy Conservation

(A fireless shunting loco has been built and already working in the plant marshalling yard and two more are under construction. (Held since 1979).

Science Popularisations : He is the first Asian to receive UNESCO's Kalinga Prize in 1963 for writing many articles in such papers as the Illustrated Weekly, Times of India, Hindustan Times etc., and books to popularize science "concentrating his efforts to improve the layman's under standing of the fundamental principles of mathematics, astrophysics, cosmology (particularly Einstein's concept of relativity and space-time), information theory underlying the construction of natural and artificial automata such as the human brain and the computers respectively, genetics, quantum chemistry, operations research, life sciences, geology etc." Other previous winners of the Prize are such eminent popularizers as Louis De Broglie, Julian Huxley, Bertrand Russell, George Gamow, Ritchie Calder and Arthur Clarke.

Books written : See List attached (Annexure – I)

Technical Papers Published : See list attached (Annexure II)

ANNEXURE - I

LIST OF BOOKS AND THEIR PUBLISHERS

1. **Mathematical Ideas – Their nature and use**
   (Published by the Hutchinson publishing Group, 178-202, Great Portland St., London W.I. and Dover Publications Inc., 180, Varick Street, New York – 14).

2. **Modern Cosmology :**
   (Published by M/s. Dover Publications Inc., 180, Varick Street, New York 14 and Penguin Books Ltd., London. Also translated into Dutch by Aula-Broken, Antwerp.).

3. **Great Ideas in Information Theory, Language and Cybernetics :**
   (Published by M/s. Dover publications Inc., 180, Varick Street, New York 14. Also translated into Italian, Japanese and Spanish).

4. **Great Idea of Operation Research :**
   (Published by M/s. Dover publications Inc., 180, Varick Street, New York-14, and Penguin Books Ltd., London. Also translated into Japanese and Italian).

5. **Some Eminent Indian Scientists :**
   (Published by publications Division, Ministry of Information & Broadcasting, Govt. of India, Patiala House, New Delhi).

6. **Story of our Railways :**
   (Published by the National Book Trust of India, A-5, Green Park, New Delhi-16 for Children in Nehru Balpustakalaya Series).

7. **Statistical Aids to Railway Operations :**
   (Published by M/s. Asia Publishing House, Calicut Street, Bombay).

8. **An Intellecutal & Cultural History of the Western World :**
   This is a joint work by a number of American eminent authors. Mr. Jagjit Singh is the only non-American invited and has contributed two chapters entitled ‘Mathematics Today’ and 'Relativity and Cosmological Revolution’.

9. **Memoirs of a Mathematician Manque :**
   (Vikas Publishing House Pvt. Ltd., 5, Ansari Road, New Delhi).

10. **Frontiers of Life Sciences :**
    (Sangam Books, New Delhi).

11. **The World of Science & Technology in 2000 A.D. :**
    (Published by the Publications Division of the Information Ministry, Patiala House, New Delhi).

12. **Great Ideas of Modern Genetics :**
    National Book Trust of India, New Delhi.

13. **Abdus Salam : A Biography :**
    (Published by Penguins India Ltd.).

14. **Reminiscences of a Mathematician Manque :**
    (Published by Har-Anand Publications, 364A, Chirag Delhi, New Delhi – 110017).

ANNEXURE – II

LIST OF BOOKS AND THEIR PUBLISHERS

1. **A Method for ascertaining the change in passenger earnings due to a change in the basis of charge :**
   Quarterly Technical Bulletin of the Indian Railway Board vol. VI No. 65. April 1942.

2. **A Study of the Secular Trend and Seasonal Fluctuations of Passenger Traffic on the East Indian Railway :**
   Published in Sankhya, the Indian Journal of Statistics, June 1943.

3. **Incidence of Ticketless Travelling on the Lucknow-Kanpur Section of the East Indian Railway :**
   Published in Sankhya, July 1943.

4. **Theories of Probability :**
   Published in Sankhya, April 1946.

5. **Quality Control in Industry and its Application to Railway Statistics :**
   Published in Quarterly Technical Bulletin of the Indian Railway Board, April 1948.

6. **Railway Statistics :**
   Published in Sankhya, November 1950.

7. **Problem of Traffic Flow in the location of the New Ganga Bridge (I) and (II) :**
   Published in Quarterly Technical Bulletin of the Indian Railway Board, October 1963 and January 1954.

8. **A short note on Wagon Turn Round :**
   Published in Sankhya, September, 1954.

9. **A suggested Application of Wald's Sequential Analysis to Railway Operation :**
   Published in Sankhya, February 1955.

10. **Quality Control in Railway Workshops :**
    Published in the Indian Railway Engineer, July 1956.

11. **Technical Paper No. 330 :**
    Published by the Director, Research and Development of the Ministry of Railways, Rly, Board-1956.

12. **Speeds of Goods Train on the Indian Railway :**
    Indian Railway Technical Bulletin Novembner 1960. Also carried by the Monthly Bulletin of the International Railway Congress Association, October , 1961.

13. **Ragnar Frisch on National Planning :**
    Published in the Indian Railway October 1963.

14. **Queing Theory and Traffic Congestion in Marshalling Yards :**

Paper presented before the Seminar of Operators Research held in April 1964 under the auspices of Operations Research Society of India and R&D Wing of the Defence Ministry.

15. **An Application of the Confrontation Theories on the North East Frontier Railway :**

Published in Sankhya; The Indian Journal of Statistics, Series B, Vol. 30, Part 3 & 4, 1968.

16. **Operations Research of South Eastern Railway :**

Published in Sankhya; India Journal of Statistics, Series B, Vol. 32, parts 1 & 2, 1970.

17. **Operations Research :**

Published in ISI Bulletin vol. 15, No. 6, 1963.

18. **Operational Research in India :**

Presidential Address in the Operational Research Society of India – February 1967.

19. **Operations Research on South Eastern :**

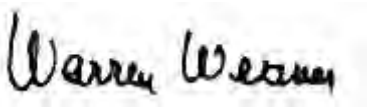
A Brochure published by South Eastern containing a description of the seventy odd specific problems solved on the South Eastern Railway by innovative Operations Research Techniques.

20. **Physiological Models and the Computer Published in Computer Studies in Humanities and Verbal Behaviour :**

a quarterly journal sponsored by the Universities of Coloredo, Kanas and North Corolina USA Vol.1/NRI/January 1968.

Kalinga Laureate for Popularization of Science – 1964

Professor Warren Weaver, USA



[Born : 17th July, 1894, Reedsburg, Wisconsin
Died : 24th November, 1978, New Milford, Connecticut]

Science tries to answer the question: “How?” How do cells act in the body? How do you design an airplane that will fly faster than sound? How is a molecule of insulin constructed? Religion, by contrast, tries to answer the question: “Why?” Why was man created? Why ought I to tell the truth? Why must there be sorrow or pain or death? Science attempts to analyze how things and people and animals behave; it has no concern whether this behavior is good or bad, is purposeful or not. But religion is precisely the quest for such answers: whether an act is right or wrong, good or bad, and why.

Warren Weaver

Warren Weaver, 1894-1978, American scientist, b. Reedsburg, Wis., grad. Univ. of Wisconsin. He taught mathematics at Wisconsin (1920-32), was director of the division of natural sciences at the Rockefeller Institute (1932-55), and was science consultant (1947-51), trustee (1954), and vice president (from 1958) at the Sloan-Kettering Institute for Cancer Research. Weaver's chief researches were in the problems of communication in science and in the mathematical theory of probability. He was one of the founders of information theory, or communication theory. His writings include the preface to the seminal work in the field, Claude E. Shannon's The Mathematical Theory of Communication (1949).

Name : Warren Weaver Sr.

Dates : 1998 –1978

Worked at : University of Wisconsin; Rockefeller Foundation

Other Information : Weaver worked at : Assistant professor, Throop College, Pasadena, CA 1917-18; Assistant professor of mathematics, California Institute of Technology 1919-20; University of Wisconsin (Madison): Assistant professor 1920-25; Associate professor 1925-28; Professor of mathematics and chairman of department 1928-32; Rockefeller Foundation: director of natural sciences 1932-55; Vice-pres. For natural and medical sciences 1955-59; Alfred P. Sloan Foundation:Trustee and member of executive committee 1956-67; Vice-press. 1959-64; Consultant on scientific affairs 1964-78; Served on numerous boards and chaired numerous committees.

While at Rockefeller Foundation, Wever promoted research in experimental biology and agricultural science, emphasizing improving human nutrition . He wrote autobiography entitled Science of Change: A Lifetime in American Science; See Contemporary Authors article (in Volume 89, p. 552) as well as Colin Burke's Information and Secrecy.

Awards : 1948 Medal for Merit; 1948 Medal for Service in the Cause of Freedom (Great Britain); 1948 LL.D. (University of Wisconsin); Sc.D.: 1949 (University of Sao Paulo – Brazil); 1961 (Drexel Institute of Technology; 1964 (University of Pittsburgh; 1951 French Legion of Honor (officer); 1957 Public Welfare Medal (NAS); **1964 Kalinga Prize (UNESCO);** 1964 Arches Science Award (Pacific Science Center).

Offices : AAAS Fellow; NAS:Press.; Chairman of the Board; American Association for the Advancement of Science Fellow; APS Councillor 1957-60.

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Warren Weaver
BIOGRAPHICAL SKETCH

Warren Weaver (b.July 17, 1894 in Reedsburg, Wisconsin d. November 24, 1978 in New Milford, Connecticut) was an American scientist, mathematician, and science administrator.

Weaver graduated in 1919 at the University of Wisconsin with degrees in civil engineering and mathematics. He became an assistant professor of mathematics at Throop College (soon to be re-named the California Institute of Technology) before returning to teach mathematics at Wisconsin (1920-32). He was director of the Division of Natural Sciences at the Rockefeller Foundation (1932-55), and was science consultant (1947-51), trustee (1954), and vice president (from 1958) at the Sloan-Kettering Institute for Cancer Research. Weaver's chief researches were in the problems of communication in science and in the mathematical theory of probability and statistics.

At the Rockefeller Foundation, he was responsible for approving grants for major projects in molecular engineering and genetics, in agriculture (particularly for developing new strains of wheat and rice), and in medical research. During World War II, he was seconded from the Foundation to head the Applied Mathematics Panel at the U.S. Office of Scientific Research and Development, directing the work of hundreds of mathematicians in operations research. He was therefore fully familiar with the development of electronic calculating machines and the successful application of mathematical and statistical techniques in cryptography.

He was co-author (together with Claude Shannon) of the landmark work on communication, The Mathematical Theory of Communication (1949, Urbana: University of Illinois Press).While Shannon focused more on the engineering aspects of the mathematical model, Weaver developed the philosophical implications of Shannon's much larger essay (which forms about 3/4th of the book).

Weaver had first mentioned the possibility of using digital computers to translate documents between natural human languages in March 1947 in a letter to the cyberneticist Norbert Wiener. In the following two years, he had been urged by his colleagues at the Rockefeller Foundation to elaborate on his ideas. The result was a memorandum, entitled simply "Translation," which he wrote in July 1949 at Carlsbad, New Mexico (Reproduced in: Locke, W.N. and Booth, A.D. (eds.) Machine translation of languages: fourteen essays (Cambridge, Mass.: Technology Press of the Massachusetts Institute of Technology, 1955), pp. 15-23.)

Said to be probably the single most influential publication in the early days of machine translation, it formulated goals and methods before most people has any idea of what computers might be capable of, and was the direct stimulus for the beginnings of research first in the United States and then later, indirectly, throughout the world. The impact of Weaver's memorandum is attributable not only to his widely recognized expertise in mathematics and computing, but also, and perhaps even more, to the influence he enjoyed with major policy-makers in U.S. government agencies.

Weaver's memorandum was designed to suggest more fruitful methods than any simplistic word-for-word approach, which had grave limitations. He put forward four proposals. These were that the problem of multiple meanings might be tackled by the examination of immediate context; that it could be assumed that there are logical elements in language; that cryptographic methods were possibly applicable, and that there may also be linguistic universals.

At the end of the memorandum, Weaver asserted his belief in the fourth proposal with what is one of the best-known metaphors in the literature of machine translation: "Think, by analogy, of individuals living in a series of tall closed towers, all erected over a common foundation. When they try to communicate with one another, they shout back and forth, each from his own closed towers. It is difficult to make the sound penetrate even the nearest towers, and communication proceeds very

poorly indeed. But, when an individual goes down his tower, he finds himself in a great open basement, common to all the towers. Here he establishes easy and useful communication with the persons who have also descended from their towars."

Weaver early understood how greatly the tools and techniques of physics and chemistry could advance knowledge of biological processes, and used his position in the Rockefeller Foundation to identify, support, and encourage the young scientists who years later earned Nobel Prizes and other honours for their contributions to genetics or molecular biology.

He has a deep personal commitment to improving the public understanding of science. He was President of the American Association for the Advancement of Science in 1954 and Chairman of the Board in 1955, a member or chairman of numerous boards and committees, and the primary author of the Arden House Statement, a 1951 declaration of principle and guide to setting the Association's goals, plans and procedures. **In 1965 he was awarded the first Arches of Science Medal for outstanding contributions to the public understanding of the meaning of science to contemporary men and women and UNESCO's Kalinga Prize for distinguished contributions to the popular understanding of science.**

Weaver married Mary Hemenway, one of his fellow students at the University of Wisconsin, a few years after their graduation. They had a son, Warren Jr., and a daughter, Helen.

Retrieved from :
http://en.wikipedia.org/wiki/ Warren_Weaver

Source :
From Wikipedia, the free encyclopedia

"The century of biology upon which we are now well embarked is… a movement of really heroic dimensions, one of the great episodes in man's intellectual history."

Warren Weaver

Science attempts to analyze how things and people and animals behave; it has no concern whether this behavior is good or bad, is purposeful or not. But religion is precisely the quest for such answers: whether an act is right or wrong, good or bad, and why.

Science is not gadgetry.

We keep, in science, getting a more and more sophisticated view of our essential ignorance.

Kalinga Laureate for Popularization of Science – 1965

Dr. Eugene Rabinowitch, USA

[Born : 27th April, 1901, St. Petersburg, Russia
Died : 15th May, 1973, Washington D. Circa, USA]

"With the penetration of science into the world of atomic nuclei, humanity has entered a new epoch. Scientific and technical progress is irreversible. With humanity basing much of its technological progress on the manipulation of nuclear forces, it is of paramount importance that war be made permanently and universally impossible.

Science develops most effectively when it is free from interference by any dogma imposed from the outside, and permitted to question all postulates, including her own. Without the freedom of scientific thought, and the freedom to exchange information and ideas, full utilization of the constructive possibilities of science will not be possible."

– Eugene Rabinowitch

Eugene Rabinowitch
Biographical Sketch

Eugene I. Rabinowitch was born on April 27, 1901 at St. Petersburg, Russia, the son of Isaac and Zinaida (Weinlud) Rabinowitch.In 1921 Isaac Rabinowitch, a lawyer, moved his family to Berlin to escape the Russian persecution of Jews. Eugene Rabinowitch attended the University of Berlin, earning there his doctorate in chemistry in 1926. After serving as an assistant in physical chemistry at the Kaiser Wilhelm Institute, Rabinowitch went to the University of Gottingen where he was a research associate in physics from 1929 to 1933. With the rise of the Nazi Party in the early 1930s, Jews, such as Rabinowitch, were expelled from their university posts. With the loss of his fellowship Rabinowitch was forced to leave Germany.

Rabinowitch with his wife, Anya Mejerson, whom he married on March 12, 1932, went first to Copenhagen to work with Neils Bohr at the Institute of Theoretical Physics. From here Rabinowitch moved to London to work with F.G. Donnan at Univesity College. Rabinowitch remained in London from 1934 to 1938. It was here that his twin sons, Alexander and Victor, were born on Auguest 30, 1934.

In 1938 Rabinowitch was invited to the United States to lecture. This resulted in the offer of a position with the Cabot Solar Energy Research Project at the Massachusetts Institute of Technology. Rabinowitch was at MIT from 1939 to 1944,when James Franck, a former colleague from Gottingen, invited him to come to Chicago. In Chicago Rabinowitch joined Franck and several other distinguished scientists at what was being called the Metallurgical Laboratory. This was in reality one of the principal research centers of the Manhattan Project. Rabinowitch worked with the Project from 1944 until its completion in 1946, serving as senior chemist and section chief of the Metallurgical Laboratory's Information Division.

In June 1945 Rabinowitch and physicist Leo Szilard authored a memorandum, which became known as the Franck Report. The memorandum, which argued against the military use of the atomic bomb, was signed by seven Metallurgical Laboratory scientists led by Franck and was personally carried by Franck to the government in Washington. D. Circa. Although it did not persuade the United States government to refrain from use of the atomic bomb without prior demonstration of its capabilities, the Franck Report is one of the earliest statements of the Concerned Scientists Movement of the 1940s and 1950s . This Movement, which marshalled the talent and dedication of several of the scientists who had worked on the atomic bomb, was born out of the scientists' conviction that the scientific community had a right, if not a duty, to speak out on the new and complicated policy issues of the nuclear age. Joined by many colleagues who had not worked on the atomic bomb but who shared their concern, these scientists worked to educate the American public and government about the significance of atomic power. Rabinowitch was an early leader in both the Movement and the educational effort, co-founding with Hyman Goldsmith the Bulletin of the Atomic Scientists. As the editor-in-chief for more than twenty years Rabinowitch maintained the Bulletin's quality and independence as a forum for discussion of scientific issues with social and political implications. As such it reflected Rabinowitch's belief in the importance of keeping the scientific community informed about the impact

on society of the twentieth century scientific and technological revaluation in which it played a significant part.

In addition to his work on the Bulletin and his participation in organizations of the Scientist's Movement, Rabinowitch continued to teach, to write, and to pursue his research interests in the field of photosynthesis. His seminal scientific work, Photosynthesis and Related Processes, was published in three parts between 1945 and 1956 and was supplemented by numerous articles on the topic. In 1947 Rabinowitch joined the faculty of the University of Illinois at Urbana as a research professor of botany. Helping to organize the University's Photosynthesis Research Laboratory, he then served as its director. From 1966 to 1968 he was also a member of the University's Center for Advanced Studies.

Rabinowitch's interest in public policy and political affairs was demonstrated in 1955, when he helped to organize the international forum, which became known as the Pugwash Conferences on Science and World Affairs. Initiated in response to increasing world tension, the Pugwash Conferences grew out of the hopes of many distinguished scientists that war could be eliminated as an instrument of foreign policy. The Russell-Einstein Manifesto, calling for the peaceful discussion of scientific issues in an apolitical arena, sparked the convening of the first Pugwash meeting in 1957. Named for the site of the first conference, Pugwash, Nova Scotia, the international meetings provide natural and social scientists with the opportunity to discuss policy issues with their collegues from around the world. Rabinowitch, a founder of the organization, served as a member of the Internatinal Continuing Committee of Pugwash from 1957 to 1973 and was president of the movement from 1969 to 1970.

In 1968 Rabinowitch retired from the University of Illinois and took a position with the State University of New York at Albany as professor of biology and chemistry and as senior advisor to the newly-established Center for Science and the Future of Human Affairs (Later called the Center for the Study of Science and Society). Rabinowitch was the guiding force behind the new Center working to obtain funds for it and establishing goals and objectives for it. The Center was to reflect Rabinowitch's own concerns with the way in which science and technology impacted on society. Rabinowitch's son, Victor, was director of the Center from 1968 to 1970. Following Victor's resignation, Eugene Rabinowitch served as acting director from March to September 1970. Rabinowitch retired from SUNY at Albany on August 31, 1972 and was immediately reappointed as a visiting professor for the 1972/73 school year. At this time Rabinowitch was given a leave of absence from the University in order to accept a fellowship with the Woodrow Wilson International Center for scholars of the Smithsonian Institute. While in Washington, he continued to write, edit the Bulletin, and participate in Pugwash. Eugen I. Rabinowitch died on May 15, 1973 at Washington, D.circa, at the age of seventy-two.

Books by Rabinowitch :

1928 : Rare Gases
1930 : Periodic System
1945 : Photosynthesis and Related Processes, Volume I
1950 : Minutes to Midnight, editor
1950 : Photosynthesis and Related Processes, Volume II, Part I
1951 : The Chemistry of Uranium, with J.J. Katz
1956 : Photosynthesis and Related Processes, Volume II, Part II
1963 : The Atomic Age, edited with Morton Grodzins
1964 : The Dawn of a New Age
1964 : Spectroscopy and Photochemistry of Uranyl Compounds, with R. Linn Belford
1969 : Man on the Moon, edited with Richard Lewis
1969 : Photosynthesis, with Govindijee
1975 : Views of Science, Technology and

Development, edited with Victor Rabinowitch

Awards Received by Rabinowitch :

1955 : Guggenheim Fellowship

1960 : D.H.L. Brandeis University (honorary)

1964 : Dr. Sci., Dartmouth College (honorary)

1966 : **Kalinga Prize, United Nations Educational, Scientific and Cultural Organization (for popularization of science)**

1967 : Columbia College, Chicago

1970 : Dr. Sci., Alma College, Michigan

1972 : American Academy of Arts and Sciences (award for promotion of international cooperation among scientists)

1972 : Woodrow Wilson International Center for Scholars Fellowship

Eugene Rabinowitch Poem

Dismiss me: I am not deserving
To freely drink Thy limpid air;
By selfsame dream always torment,
I know for certain, that these children,
Now playing on the sun-warmed sand,
Will se the century declining.
In such a fire, in such a gloom,
That even we, whom Furies followed
Across the earth, through acrid smoke,
Have never known the desperation,
To which Thou hast condemned them.

Penned in the Year 1939

"Eugene Rabinowitch was a man of many facets: a scientist and a teacher; a classics scholar and a modern philosopher; a poet and a man of letters; a journalist and an editor; a sociologist and a politician. But his main characteristic was simply as a human being, with a warm heart, filled with love and tenderness, not only for his family and friends, but for the whole of mankind. This love for humanity, and his profound belief in the potential of science to ensure a happy life for all, were the guidelines throughout his whole life, the philosophy on which all his activities were based."

Sir Joseph Rotblat

Sir Joseph Rotblat is President Emeritus of the Pugwash Conferences, having served as President from 1988-1997. In 1995 he was awarded the Nobel Peace Prize in recognition of his work, through Pugwash, towards nuclear disarmament.He is Emeritus Professor of Physics at the University of London.

8 August 2000.

Kalinga Laureate for Popularization of Science – 1966

Professor Paul Couderc, France

[Born : 15th July, 1899
Died : 5th February, 1981]

"A delay between the scientific discovery and its assimilation into the general culture is inevitable.. But since this discovery is by nature to modify immensely the methods of thinking (Relativity, Quantum, Nuclear Energy) the gap which is caused between the specialists and the common public is not without danger, after all at a time like ours where the Science is reproached of becoming a danger for the civilization and to the humanity."

Paul Couderc

PAUL COUDERC

A CURRICULUM VITAE

French author and astronomer at the Observatoire of Paris who pursued number of various interests, including solid geometry, astrology, calendars, and eclipses. Couderc was educated at higher Teacher training school. He began his career as teacher of mathematics at Charlemagne College in Paris, and wrote classic book on solid geometry. Afterwards, he became leading astronomer at the Observatoire of Paris. He wrote number of books on popularization of science, especially on relativity, astronomy, and astrophysics, and received the 1966 Kalinga Prize for popularization of science.

- Born on July 15th 1899, deceased on February 5th , 1981
- Admitted to Ecole Normale Supérieure Military service 1918
- Professor of mathematics (high school) 1922
- Head of the department of Carte du Ciel of Observatoire de Paris 1944
- Collaborator of the Vice-Secretary of State for Scientific Research, 1936, and therefore partly responsible for the creation of Institut d 'Astrophysique de Paris, of Observatoire de Haute-Provence, also of Palais de la Découverte.
- Directeur scientifique of the planetarium of Palais de la Découverte 1952.
- Distinguished admission in Légion d'Honneur (Chevalier 1947, Officier 1957)
- President of Commission of Carte du Ciel of the International Astronomical Union (1958-1964)
- Vice President of Société Astronomique de France (1950-53, 1957-60, 1964-69)
- Organisation of the publication of a number of introductory papers for students, in the Journal of the Société Astronomique de France : L'Astronomie (many written by himself) 1950-1966.
- Organisation of radio conferences broadcasted by Poste National and later published (1954, Gauthier Villars).
- Numeous prizes by Académie des Sciences (De Parville, Pelliot etc.)
- Distinction of Académie des sciences for his book: La relativité, which had numerous editions, (134), including some in Italian and Spanish.
- **KALINGA Prize attributed by UNESCO 1966**
- Publications of numerous books (see list) and construction of a film (les flames du Soleil) as a tribute to the famous optician and astronomer B. Lyot.
- Besides a few researches (e.g. about binaries and stellar luminosity function), his main work in astronomy was a definite advance in the long lasting programme : Carte du ciel.

A list of some books by P. Couderc :

Couderc List. Txt

Here is a list of a few books written by P. Couderc and kept at the library of Observatoire de Paris :

- L' architecture de l' Universe – Gauthier-Villars 1941
- L'architecture de l' Univers – Gauthier- Villars 1947
- Astrologie Presses Universitaires PUF 1974
- Astrologie. Presses Universitaires PUF 1951
- L 'astronomie au jour le jour; trente-sept causeries radiophoniques Gauthier-Villars 1954
- L 'Astronomie Bordas 1968
- Le Calendrier – Presses Universitaires PUF 1948
- Le calendrier – Presses universitaires PUF 2000
- Dans le champ solaire avec un spectre coloré, 36 planches – Gauthier – Villars 1932
- Discussion sur l 'evolution de l' univers, Gauthier-Villars et Cie 1933
- Les éclipses Presses universitaires PUF 1961
- L' encyclopédie et l 'astronomie Conférences – Sorbonne 1952
- Les étapes de l 'astronomie Prsses universitaires PUF 1945
- L ' expansion de l' univers Presses Universitaires PUF 1950
- Guide des étoiles et Planetes (traduction) Menzel, Donald Howard,
- Editions Delachaux et Niestlé 1978
- Historie de l'astronomie classique PUF 1982
- Histoire de l'astronomie Presses Universitaires PUF1966
- L 'Observatorie de Paris Observatoire de Paris 1967
- Parmi les étoiles Bourrelier & Cie 1938
- Premier livre du tétraèdre à l 'usage des élèves de première - Gauthier-Villars
- La relativité Presses universitaires 1949
- La relativité Presses universitaires PUF 1981
- L'Univers P.U.F. 1982
- L'univers Presses universitaire PUF 1955
- L'Univers 1937 Les Editions rationalists 1937
- L'Unives est-il en expansion ? – Palais de la Decouverte 1953.

A True Master of Scientific Popularization
[Paul Couderc (1899-1981)]

by
Gerad De Vaucouleurs
University of Texas

&
Gilbert Walusinki
Secretary of the Committee for Astronomical Teaching Affairs

The Astronomy of March 1981 announced in a few lines the apparent demisal in Paris on the 5th of the preceding month of Paul Couderc, the ancient professor holder of aggregation (highest teaching diploma in France) in Maths, appointed honorary Astronomer of the Observatory of Paris, for a long time one of the most active members of Astronomical Society of France, who had served for 20 years as an advisor and Vice President.

We think if even though the tradition of Obituary columns seem to be outdated. The astronomy must pay homage to this Vice Prsident and the author of innumerable articles published in may pages and also to his several conferences delivered in clubs since three decades.

But whatever big achievements that might have been for Paul Couderc passing through the helm of the SAF, particularly with old students in the beginning and with the other colleagues later on, that we wish to pay homage to his memory, we wish to recollect and honor this man, - the scientist, the Professor and the scientific writer that we had admired who had played a determining role in the astronomical vocations-teacher and propogandist of one of the most beautiful sciences.

We should therefore examine first how our master regretted scientific popularization of which he played an essential role.

This is what he had said :

“I do not consider it as an incidental activity for the popularization of the science of which I had consecrated a great part of my time leaving behind the professional works. I hold it an essential mark for the society.

By the way, we are not making any allusion here (undoubtedly regrettable but difficult to ignore), that the various disciplines obtained proportionate budgetary credits in their surrounding propaganda. In most disinterested reasonings could invoke in favour of good rights towards diffusion of the science.

A delay between the scientific discovery and its assimilation into the general culture is inevitable.. But since this discovery is by nature to modify immensely the methods of thinking (Relativity, Quantum, Nuclear Energy) the gap which is caused between the specialists and the common public is not without danger, after all at a time like ours where the Science is reproached of becoming a danger for the civilization and to the humanity.

The silence of the Scientist leaves behind ultimately to free forces of false sciences, giving hopes to deceivers/cheaters, so called sensational discoveries which are showered in the dailies and magazines for the readers. A scientific ignorance still prevalent in common mass holds good to the invasion of the nonsensical."

Paul Couderc expressed like this, better than what we would have known, the principles of his action. It is up to us to find out his success.

Of course without any doubt, there have been a conjunction of numerous factors. His Nivernois (near the Rhime in France) origin Paul Couderc had preserved a charming voice which could hold the attention of his listeners (Professor Francis Perrin who was his fallow-student in the Normal Higher School) have told us that he retained a souvenir of his warm voice. But it was not only his voice that demanded the attention but particularly his clear eloquence corresponding to his worry of being included twice as much for the respect for the language and for the Science.

His becoming the Professor of Mathematics (1922) had given the taste for communication which he developed in the favourable frame work in the Normal Higher School to a great intellectual level, at the outburst of the big battle the appearance of the general Relativity turning upside down the ideas received. The debates were vivid in between persons in favour and those against the views of Einstein.

Paul Couderc for the enthusiast brought about a theory in Astronomy, this was the time when Eddington studied the solar eclipses in 1919 and measured the deviations of pre seen illuminating rays and calculated by Einstein.

This passionate epoch had its dark sides too. Born in 15th July 1899. Paul Couderc attained the age of higher studies while the battle cut down his European youth. He was mobilized in 1918 before he could enter the Normal School. Later after some years of training in the Observatory of Paris and in Thiers Foundations, the only situation which offered him in Astronomy was to assist voluntarily in the Observatory. There was a significant misery in the scientific research of France at that time. Without breaking off his atronomical contacts which he had taken in the background, Paul Couderc took up the post of Professorship of Maths in Higher Secondary School, first in Chartre, then later in Paris in the Lycee of Saily till the period of Liberation. It was only in 1944 that he was called in for the Observatory of Paris to take over charge from Mr Jules Baillaud at the head of service of the sky card.

The passage of time in teaching in the higher secondary schools didn't make Paul Couderc a purgatory neither did he lose his interest in the Astronomy.

Teaching of Maths to future high school holders could have distanced him particularly from the activities of science and could have easily discouraged a person who would not have occupied a job out of his heart but this was not at all the case for Paul Couderc. It was just the contrary for him. During the first half of his career made his conviction stronger that teaching higher secondary could help scientific development and in the rational thinking. It is during his teaching period that he published his two books which straight away became two master pieces.

"The Architecture of the Universe" in 1930 and "In the Solar field" in 1932, one could easily discover texts of modern Astronomy and inspiration generated from the communicative enthusiasm of Paul Couderc.

The first a thinner book more ambitious (the title undoubtedly indicates it) was the most successful one. It does not contain only outside descriptions, the results of the observations but moreover it was a beginning for the firs time in France, an exposure of modern cosmology in the framework of relativist models. The public concern was very large and the worries to understand the science of their times. Like Jean Rostand in another sphere, like Flammarion half century later and the example of Jean Perrin with the Atoms, Paul Couderc contributed with his Architecture of the Universe to reveal that there are no two antinomian cultures, one literary, the other scientific. It is therefore not surprising that Jean Perrin wrote a preface which all of know by heart the first lines:

"It is a very weak light which comes to us from the starry sky. What would have been the human thinking if we would not have perceived these stars, it appears like the sister of Venus, the Earth enveloping always a hammer of clouds?'

The Astronomy is the "Liberation of human reasoning" concluded Jean Perrin.

In no way a single perspective can be servable to Paul Couderc. Inspite of age differences a true friendship brooded between them. Since Jean Perrin became the under Secretary of state for scientific research in the Blum's ministry in 1936, he called Couderc in his cabinet as in-charge of mission. In this capacity, Couderc played a very important role in the creation of the National cash box for sciences, ultimately National Centre for Scientific Research (CNRS)-which adapted and followd in lines of Astronomy, foundation of the Institute of Astrophysics of Paris with Henri Mineur, founding of the Observatory of Haute Provence with Jean Dufay and Charles Fehrenbach. It gave birth also to the organization Palace of discovery, one of the most successful International exhibition in 1937 which inspired the title of his book "Universe 1937" . We understand that Paul Couderc was always very attentive in materializing the Palace and his Planetarium in particular. In 1937 he was in total charge and in 1952 he served as scientific Director of the Planetarium renovated and dedicated to the nation by the President of the Republic. After having entered in the Observatory unrolled his second half of his career, Paul Couderc routined with his accrued methods in teaching and in popularizing of Astronomy often in collaboration with André Danjon who came to succeed in Ernerst Esclangon at the instruction from French Astronomy (1945). In such the initiative to organize a series of conferences aimed at teaching and training the secondary-students in brining about a reform in the spirit of Couderc a renaissance-of traditional teaching of "Cosmology" in final classes. Danjen and Couderc were seconded by the elite of French Astronomy of that period, D Chalonge, A Couder, J.Delhaye, Ch.Fehrenbach, V. Kourganoft, A. Lallemand, J.C.Pecker, E.Schatzman. All of us regret still for not having being able to assure the publication of these conferences that Couderc so passionately followed.

In the same order of ideas, always under impulsion of Paul Couderc (Astronomy 64, 1950, page-21) a long series of articles specially written for the students was published in the review columns of 1950 to 1966 and to which Paul Couderc himself contributed a lot. During the same period he organized with Jean Claude Pecker and Evry Schatzman a successful series of 37 radio phonic conversations prepared for National Post in the titles programme "Hour of French Culture" these conversations were republished in a brochure By Gauthier-Villars (1954) titled "Astronomy day to day"

With this background of practical language of teaching in Higher secondary school, and by his experience of public conferences in the Polytechnic School, Paul Couderc had acquired an acute mastery in communication . The convictions of rationalists came to him always for explanations and for convincing others. It was very natural for Pual Couderc who took a great interst in the popularisation of science for which he put all his talents in writing. He always aimed loftily: respect for the science while he did not wish to hide anything about the incertitudes, neither the provisional failures, everything for the enthusiasm of success; respect for the harshness of his scientific methods, same as well for the difficulties in popularizing having incited to more unless correct schematisation; respect for the public understanding having limited capacity for understanding, but an accomplished author like Paul Couderc went further on, very often a little farther than capable. **The mixing of such merits is very rare and it is not surprising that he was awarded with the KAKLINGA prize in 1966 by UNESCO-a rare distinction of such kind.** In recognition to his testimonies the science academy awarded several prizes Prize Henri De Paville, Prize Paul Pelliot etc….

The list of books by Paul Couderc (see the bibliography) illustrates the rarity of his talents: the titles themselves add meanings to the collectrions "what do I know/" which is absolutely enthralling. In his 128 pages of volume collection a specific subject is treated first by the rules of composition and of writing. Yet, the first subject treated by Couderc, THE RELATIVITY (1940) is an exemplary success-acknowledged and crowned by by the Academy of Sciences, this book was eventually got translated in to Italian and Spanish and had 130 new editions from 1941 to 1966. The most recent after death of Couderc was beneficial to Francis Perrin who brought out. The relativity was undoubtedly a favourite subject of Paul Couderc. In the steps of Astronomy (1945) Couderc traces the evolutions of ideas since the Antiquity and the impact of Copperniccus in the dawn of modern times: this illustration and the justification of the role of "Liberation of Human Reason" with Jean Perrin attributed to Astronomy. In the Calendar (1946) he attacks further to the historical aspects, but explains equally the basic details of astronomy which are often difficult to understand of various calendars; always his works referred on the subjects in an attempt to popularize sensationally. In Astrology (1951), sincere to his rationalist convictions, Couderc deals with the ridiculous and prevalent superstitions (beneficial for certain) of all times; after having explained consciously in detail the precise rules astrology which were considered inauspicious in the course of time. He subdued certain predictions which were typical or sensational to a vigorous confrontation with experience or observation, citing his statistical studies undertaken with patience for testing objectively the validity of astrological predictions:the readers of astrology will not be surprised by the conclusion of Paul Couderc: "What does astrology want? –Nothing, exactly nothing". One can well imagine the reaction of the charlatans, abusing and menacing In the Universe (1954) Paul Couderc actualizes the theme which was dear to cosmological problems – work undertaken today by Jean Claude Pecker, reedited in 1982 by slight modifications.

In the Eclipse (1961), volume published during the total solar eclipse which took place in France, the universal spirit of astronomy and of the writer and his sense of actuality permitted him to fulfill the vacuum of astronomical literature in French.

It is worth mentioning about the film “Flames of Sun” that Paul Couderc undertook as a documentary film produced by Bernad Lyot and completed by the Observatory of Havard College. He himself addressed it as he wanted to pay homage to his collègue Lyot.

We have reserved for the end the most specialized work of a little bit higher level in our opinion the best and most durable of all the works published by Paul Couderc. When we re-read it today The expansion of the Universe (1950), we are in awe-the clarity revealed on such a difficult subject in its theoretical bases and complicated by effective observations. Paul Couderc describes us the classification and models of relativist’s Universe (without neglecting the cosmological constant like superficial popularisors very often do it today) as he explains formerly fossilized radiation at 3 K, which were substituted by the Big Bang heat of Gamow at the primitive atom, cold of Lemaitre, the work of Paul Couderc is always based on actuality and his lectures had excellent introduction to the relative cosmology. Even if the future progress loses this quality, the luminous exhibition of Paul Couderc will be remembered always for his higher exemplary in popularizing astronomy in the middle of the century. For similar reason-with a good different style that Flammarion even surpassed interest us always for re-reading. With the passage of time, the books of Paul Couderc will know undoubtedly the hectic public disaffection towards newness, but the more attentive readers will come to appreciate the historical perspective and of a less superficial culture for a long time.

Heavily engaged in the field of diffusion of astronomy and deeply engrossed with his teaching freely in his carreer, paul Couderc did not have much time for research. It will be unfair on him not to include his studies about the optical ring (halo) around Persei Nova 1901 (year of Astrophysics 2, 1939, 271) remarkable for its simplified geometry as usual with exceptional clarity. It is also to be noted here about his statistical studies on the double stars in the chart of sky (1946) in collaboration with Danjon, research on the function of luminosity of new stars (Comptes Rendus Ac.Sci. **230.** 1950, 2137). But the official function of Paul Couderc at the service of the chart of sky was not evidently favourable for carrying out research on extragalaxtical cosmology which fascinated him.

Paul Couderc became our first professor or initiator in Astronomy. We have had the privilege of gaining his friendship . We can never forget the warmth and the sincerity.

Francis Perrin remarks in confidence to us, that Paul Couderc was his father’s friend prior to becoming his intimate friend towards the end part of his life.”

Kalinga Laureate for Popularization of Science - 1967

Professor Sir Fred Hoyle, FRS
United Kingdom

[Born : 24th June, 1915, Bingley, Yorkshire, England
Died : 20th August, 2001, Bournemouth, Dorset, England]

"Every Cluster of galaxies, every star,
every atom … had a beginning, but the universe, itself, did not."
..... Sir Fred Hoyle

Sir Fred Hoyle (1915-2001)

Distinguished and controversial British astronomer, mathematician, popularizer of science, and novelist, who rejected the "big bang' theory. "Every cluster of galaxies, every star, every atom had a beginning, but the universe itself did not," Hoyle claimed. He coined the phrase "big bang" to mock the opposing model, according to which the universe originated from a spontaneous explosion. Hoyle also suggested that life had a cosmic, not terrestrial origin, and viruses could originate from certain meteor streams. He He supported the anthropic principle, holding that there is a design in creation: the universe was designed in such a way as to produce life. "Our existence dictates how the universe shall be," he stated, and added, "a fine ego-boosting point of view on which you may travel, fare paid, to conferences all over the world." Besides scientific works, Hoyle published many science fiction novels, written in collaboration with his son, Geoffrey Hoyle.

> **"The astronomer Fred Hoyle once remarked to me that it was pointless for the world to hold more people than one could get to know in a single lifetime. Even if one were president of United Earth, that would set the figure somewhere between ten thousand and one hundred thousand; with a very generous allowance for duplication , wastage, special talents, and so forth, there really seems no requirement for what has been called the global village of the future to hold moire than a million people scattered over the face of the planet." (Arthur C. Clarke in Greetings, Carbon-Based Bipeds, 1999)**

Fred Hoyle was born in Bingley, Yorkshire, as the son of a wool merchant and a teacher. He started to study stars early in his childhood. At the age of four he could write out the multiplication tables up to 12x2 = 144. By the age of thirteen, he had begun to read widely, from such books as *Arthur Eddington's Stars and Atoms* to T.E. Lawrence's *Seven Pillars of Wisdom.* However, instead of astronomy he first studied mathematics at Cambridge University's Emmanuel College. Hoyle received his B.A. in 1936 and his M.A. in physics from Cambridge in 1939. In the same year he married Barbara Clark; they had a son and a daughter. In 1939, under the influence of his colleague Raymond Lyttleton, Hoyle's interest started to shift from mathematical physics toward astrophysics. He had attended Eddington's lectures in 1935-36 and answered his questions on general relativity in examination.

Hoyle was elected a Fellow of St. John's College at Cambridge in 1939. During World War II Hoyle worked at the Admiralty Signals Establishment, later Admiralty Weapons Establishment, where he participated in the development of radar.During this period he met Hermann Bondi and Thomas Gold. With them he developed the revolutionary "continuous creation" theory or the "steady-state" cosmology. Hoyle's paper was published in the journal of the Royal Astronomical Society in 1948. Hoyle's *Nature of the Universe* (1950) introduced the theory to a wider audience. Although the "big bang"hypothesis was confirmed in 1960s and became a scientific paradigm, Hoyle continued to examine its weak points. The hypothesis had been introduced in the 1920s by Georges LeMaitre(1894-1966), a priest and cosmologist. When evolution theory had been a problem for the Catholic Church, the "big bang" was not – partly because it strongly supported the idea of creation.

In 1945 Hoyle became a junior lecturer in mathematics at the university of Cambridge. His three teaching terms took up less than twenty-five weeks of the year, and for the rest of the time he could pay attention to research. In 1946 he sent for publication to the Royal Asronomical Society two papers, the longer was "The Synthesis of the Elements from Hydrogen' and the shorter was 'Note on the Origin of Cosmic Rays', in which he predicted that heavy elements would be found in cosmic rays. The prediction ws confirmed twenty-two years later. For the BBC he made five lecture-type talks on astronomy, which were printed in *The Nature of the Universe.* The book was well received and the Hoyles celebrated the success by buying their first refrigerator.

In the 1950s Hoyle collaborated with William Alfred Fowler and Geoffrey and Margaret Burbidge in developing a theory on the origin of the elements, which earned Fowler the Noble Prize for physics in 1983. In 1957 they published I. *Synthesis of the Elements in Stars,* the first comprehensive account how the elemens are produced in the interior of stars. The "I" in the title meant that there would be a second paper. However, part II never appeared. Fowler has acknowledged his debt to Hoyle in his autobiography written for the Nobel Foundation: "Fred Hoyle was the second great influence in my life. The grand concept of nucleosynthesis in stars was first definitely established by Hoyle in 1946."

Hoyle was a staff member of the Mt. Wilson and Palomar Observatories from 1956 until 1965. In 1958 Hoyle became Plumian professor of Astronomy and Experimental Philosophy at Cambridge. The work took him to the top of the British astronomical establishment. One of his many achievements was the founding of the Institute of Theoretical Astronomy at Cambridge. It started in 1967 and Hoyle served as the first director. Hoyle also was vice president of the council of the Royal Society, president of the Royal Astronomical Society, member of the Science Research Council from 1967 to 1972, and a foreign member of the American Philosophical Society and of the National Academy of Sciences. Hoyle was knighted in 1972, at the age of 57, but at that time he felt he had had enough of the Cambridge system and resigned from his formal appointments in the UK. During this period he published one of his most pessimistic novels, *The Inferno* (1973), in which the nucleus of the Milky Way explodes. Cosmic particles cause a global disaster, wiping out nearly all human life. The protagonist is a physicist who represents the voice of reason in the world of insanity. He becomes the leader of a clan in Scotland. Hoyle's message is clear – scientists should rule the world in a time of crisis.

After leaving Cambridge Hoyle worked at the California Institute of Technology, and at Cornell. Hoyle's nomadic phase ended by the spring of 1977-Hoyle stayed outside the United Kingdom during these years mainly due to the tax laws of the Wilson government. The intervening years he spent partly in writing, in research, and partly in giving lectures. He published books on a wide variety of subjects, which were noted for their originality. Between the years 1975 and 1985 he examined the big problem of the origin of life. With Chandra Wickramasinghe, his former student, he wrote among others *Life cloud* (1978), on the origin of disease, and Diseases from Space (1979) and *Evolution from Space* (1981). In these works he argued that organic molecules from comets are deposited on Earth during close encounters or impacts, they join the gene pool and make evolution possible. *Copernicus* (1973) dealt with the history of astronomy. *From Stonehenge to Modern Cosmology* (1972) was about archeo – astronomy. Hoyle's autobiography, *Home Is where The Wind Blows*, appeared in 1994. In its last page he wrote: "After a lifetime of crabwise thinking, I have gradually become aware of the towering

intellectual structure of the world, One article of faith I have about it is that, whatever the end may be for each of us, it cannot be a bad one." Hoyle died in Bournemouth on August 20,2001.

In Hoyle's novels the heroes are scientist, who are opposed by politicians. Alien or cosmic intelligence is often beyond human comprehension, but also dangerously ignorant of the value of human life. In *The Black Cloud* (1957) a sentient cloud kills nonchalantly one quarter of the world's population. In *The Westminster Disaster* (1978) the buildings of Whitehall come "down life so many rotten fruit" after a terrorist attack. Scientists are not hindered by catastrophes in thaeir attempt to communicate with super-intelligence-they are objective and willing to learn the secrets of the universe. In *Ossian's Ride* (1959) the protagonist gladly joins aliens who plan to transform Earth into a high-tech world. In crisis politicians want to hide the truth from people and army officers react with missiles.

> "**Astronomy is kind in its treatment of the beginner. There are many jobs to be done, jobs that can lead to important results but which do not require great experience. Jensen's was one of these. He was searching for supernovae, stars that explode with uncanny violence. Within the next year he might reasonably hope to find one or two. Since there is no telling when an outburst might occur, nor where it the sky the exploding star mighbt be situated, the only thing to do was to keep on photographing the whole sky, night after night, month after month. Some day he would strike lucky." (from The Black Cloud)**

The Black Cloud dealt with one of Hoyle's favorite subjects – intelligent life in the universe. The story sarts in the year 1964. At Mt. Palomar Knut Jensen finds that a giant cloud of interstellar gas is approaching the solar system. Professor Chris Kingsley from Cambridge calculates that the cloud will come between the Sun and Earth, which will lead to a global catastrophe. Hoyle follows the work of the scientist and reactions of politicians who first want to keep the cosmic threat a secret. Hoyle's attitude to civilians is ironic; only the scientist can coolly analyze the situation. The effects of the cloud are disastrous when it arrives in the solar system. But it turns out that the cloud is alive, and it starts to communicate with the scientist-it has opinions about music, the roles of men and women, evolution, and the origin of headaches. When the governments of the United States and the Soviet Union try to destroy it with missiles, it sends them back. The cloud leaves the solar sysem, encouraging humankind to create more geniuses. – The story also aroused the interest of Wolfgang Pauli, the Nobel Laureate in Physics in 1945, who told once to Hoyle that he had studied it together with Carl Jung, who wrote a rcritical essay on it. "I didn't have the temerity to explain that I thought I was only writing a story. But I had an intelligent life form in the story that didn't think in words, a form that had to learn words before it could communicate with man. Pauli knew all about Schrödinger's cat, about arguments over the origins of mathematics, while Jung knew about human emotions. So it was evidently the problem of what lies behind words that had been occupying them." (from *Home is where the Wind Blows by Fred Hoyle,* 1997)

With John Elliot Hoyle co-wrote the BBC television serials *A for Andromeda* (1961) and *Andromeda Breakthrough* (1962), starring Julie Christie. In the story messages from the direction of the Andromeda galaxy contain a blueprint for making a female android. *Rockets in Ursa Major* (1962) was originally written for the Mermaid Theatre. In the story a rocket ship, launched to Ursa Major, returns without the crew, with a message from its captain:"If this ship returns to Earth, then mankind is in deadly peril-God help you –". Earth is drawn into a galactic war, but with the help of human-like aliens, the world is saved, not evacuated.

"All other eating places were now completely automatized, choice remaining only in the different ways of ordering one's food, and I suppose the decor came into it. For instance, the inexpensive cafés are very simple. You sit at a long table with a moving panel in the middle. Having chosen from the menu list, you punch your choice and the food comes up within seconds on the moving panel. In more expensive restaurants there are separate tables. A microphone is used to order food. According to the advertisements, this is the personalized way." (from *Rockets in Ursa Major,* 1962)

In *Fifth Planet* (1963) the year is 2087. A new solar system with a sun named Helios, approaches ours, but would not really disturb the orbital path of the Earth. The Euro-American and Communist blocks launch rival rocketship expeditions to explore Achilles, the planet of Helios. The western crew, professor Hugh Conway, Mike Fawsett and two other members, lose the race-the Russians land first, but unluckily. The planet is Earth-like with its atmosphere and green hills. In the spirit of détente the crews work together and find a strange transparent construction, but not much else. An alien returns to Earth in the body of Fawsett, and then takes the body of Cathy, Conway's wife, telling him the secret of cosmic lifebank. Conway accepts the marriage of human and alien mind. A global hallucination of the nuclear war shocks the world. Conway escapes to the grassy wandering planet with Cathy, carrying the homesick alien.

For further reading: Origins: The Lives and Worlds of Modern Cosmologists by Alan Lightman and Roberta Brawer (1990); The Encyclopedia of Science Fiction, ed. by John Clute and Peter Nicholls (1993) –

For further information : **Fred Hoyle-Sir Fred Hoyle** – **An interview with Fred Hoyle,** Cambridge, England, 5 July 1996-**Physics Today –** The Bruce Medalists – Fred Hoyle's The Intelligent Universe

Note : **Arthur C. Clarke** has prophesied that in the year 2061 first humans land on Halley's Comet, and the discovery of both dormant and active life-forms vindicates Hoyle and Wikramasinghe's hypothesis that life is omnipresent throughout space.

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- **The Nature of Universe,** 1950
- **Frontiers of Astronomy,** 1955
- **Men And Materialism,** 1956
- **Synthesis of the Elements in Stars,** 1957 (with William Fowler and Geoffrey and Margaret Burbidge)
- **The Black Cloud,** 1957 – Musta pilvi
- **A for Andromeda: A Novel for Tomorrow,** 1962 (with John Elliot) – television series in 1961
- **Ossians' Ride,** 1959
- **Astronomy,** 1962
- **Rockets in Ursa Major,** 1962 (play for children)
- **Star Formation,** 1963
- **Fifth Planet,** 1963 (with Geoffrey Hoyle) – Viides planeetta
- **Of Men and Galaxies,** 1964
- **Andromeda Breakthrough,** 1965 (with John Elliot) – television series in 1962
- **Galaxies, Nuclei and Quasars,** 1965
- **October the First is Too Late,** 1966 (with

Geoffrey Hoyle) – Los Angeles ei vastaa
- **Element 79,** 1967
- **Rockets in Ursa Major,** 1969 (with Geoffrey Hoyle, based on a play)
- **Seven Steps to the Sun,** 1970 (with Geoffrey Hoyle)
- **The Molecule Men and The Monster of Loch Ness,** 1971 (with Geoffey Hoyle)
- **From Stonehenge to Modern Cosmology,** 1972
- **The Inferno,** 1973 (with Geoffreyu Hoyle)
- **Nicolaus Copernicus,** 1973
- **The Relation of Physics and Cosmology,** 1973
- **Into Deepest Space,** 1974 (with Geoffrey Hoyle)
- **Astronomy and Cosmology,** 1975
- **Highlights in Astronomy/Astronony Today,** 1975
- **Ten Faces of the Universe,** 1977
- **The Incandescent Ones,** 1977 (with Geoffrey Hoyle)
- **On Stonehenge,** 1977
- **Life cloud,** 1978 (with Chandra Wickramasinghe)
- **The Westminster Disaster,** 1978 (with Geoffrey Hoyle)
- **The Cosmology of the Solar System,** 1978
- **Diseases from Space,** 1979 (with C. Wickramasinghhe)
- **Space Travellers: The Origins of Life,** 1980 (with C. Wickramasinghe)
- **Commonsense in Nuclear Energy,** 1980
- **Evolution from Space,** 1981 (with C. Wickramasinghe)
- **Ice,** 1981
- **The Universe According to Hoyle,** 1982
- **The Energy Pirate,** 1982 (the Professor Gamma series, with Geoffrey Hoyle)
- **The Frozen Planet of Azuron,** 1982 (the Professor Gamma series, with Geoffrey Hoyle)
- **The Giants of Universal Park,** 1982 (the Professor Gamma series, with Geoffrey Hoyle)
- **The Planet of Death,** 1982 (the Professor Gamma series, with Geoffrey Hoyle)
- **The Intelligent Universe,** 1983
- **Comet Halley,** 1985
- **The Small World of Fred Hoyle : An Autobiography,** 1986
- **Cosmic Lifeforce,** 1988 (with C. Wickramasinghe)
- **Home is where the wind Blows: Chapters from a Cosmologist's Life,** 1994
- **Mathematics of Evolution,** 1999
- **A Different Approach to Cosmology**: **From a Static Universe Through the Big Bank Towards Reality,** 2000 (with Geoffrey Burbidge and Jayant V. Narlikar)

The Universe does not respect the differences between Physics, Chemistry & Biology

..... Sir Fred Hoyle

Kalinga Laureate for Popularization of Science - 1968

Sir Gavin Rylands de Beer, FRS
United Kingdom

[Born : 1st November, 1899, Malden, near London, England
Died : 21st June, 1972, Alfriston, Sussex, England]

Each ontogeny is a fresh creation to which the ancestors contribute only the internal factors by means of heredity.

...Gavin de Beer

Sir Gavin Rylands de Beer, FRS (1899-1972)
World Famous Embryologist & Evolutionist
A Biographical Profile

Born 1899; educated at the Ecole Pascal, Paris, Harrow School and Magdalen College, Oxford, 1917; Grenadier Guards and Army Education Scheme, 1918-1919; Magdalen, 1919-1921; graduated with Zoology degree in 1921; fellow of Merton College, 1923-1938; taught in the University Zoology Department until 1938; reader in embryology, University College London, 1938; Professor, 1945-1950; World War-II work in intelligence, propaganda and psychological warfare; Fellow of the Royal Society, 1940; President of the Linnean Society, 1946-1949; Director of the British Museum (Natural History), 1950-1960; knighted, 1954; retired, 1960; lived in Switzerland, 1965-1971; died 1972. Publications : Growth (London, 1924); Early travelers in the Alps (London, 1930); Vertebrate zoology (London, 1932); An introduction to experimental embryology (Oxford, 1934); De Beer and Julian Sorell Huxley, Elements of experimental embryology (Cambridge , 1934); The development of the vertebrate skull (Oxford, 1937); edited, Evolution. Essays on aspects of evolutionary biology presented to Professor E S Goodrich on his seventieth birthday (Oxford, 1938); Alps and elephants. Hannibal's march (London , 1955); Darwin's Journal (London, 1959); edited Darwin's notebooks on transmutation of species (London, 1960); Charles Darwin: evolution by natural selection (London, 1963); Atlas of evolution (London, 1964); Jean-Jacques Rousseasu and his world (London, 1972).

Sir Gavin Rylands de Beer FRS (1899-1972) was a British evolutionary embryologist, director of the British Museum (Natural History) and president of the Linnean Society.

Biography :

Born on November 1, 1899 in Malden, Surrey (now part of London), de Beer spent most of his childhood in France, where he was educated at the Parisian École Pascal. During this time, he also visited Switzerland, a country with which he remained fascinated for the rest of his life. His education continued at Harrow and Magdalen College, Oxford, where he granduated with a degree in zoology in 1921, after a pause to serve in the First World War in the Grenadier Guards and the Army Education Scheme. He soon became a fellow of Merton College and began to teach at the university's zoology department. In 1938, he was made reader in embryology at University College, London, and served in the Second World War in intelligence, propaganda and psychological warfare. Also during the war, in 1940, he was elected Fellow of the Royal Society[1].

In 1945, de Beer became professor of zoology and was, from 1946 to 1949, president of the Linnean Society. This was followed by his directorship of the British Museum (Natural History) (now the Natural History Museum), from 1950 until his retirement in 1960. He was knighted in 1954.

After his retirement, de Beer moved to Switzerland and worked on several publications on Charles Darwin[2] and his own seminal Atlas of Evolution. He returned to England in 1971 and died at Alfriston, Sussex on June 21, 1972.

Work :

De Beer's early work at Oxford was strongly influenced by J.B.S. Haldane and Edwin S. Goodrich (one of de Beer's teachers). This work concerned experimental embryology, and some of it was co-written with Julian Huxley, who would go on to be one of the leading figures of the modern synthesis. However, while Huxley went on to include aspects of population genetics in his work, de Beer turned to comparative embryology and evolutionary embryology.

Much of de Beer's work stressed the importance of heterochrony [3], and especially paedomorphosis in evolution.According to his theories, paedomorphosis (the retention of juveline features in the adult form) is more important in evolution that gerontomorphosis, since juvenile tissues are relatively undifferentiated and capable of further evolutin, whereas highly specialized tissues are less able to change. He also conceived the idea of *clandestine evolution,* which helped to explain the sudden changes in the fossil record which were so at odds with Darwin's gradualist theory of evolution. If a novelty were to evolve gradually in an animal's juvenile form, then its development would not appear in the fossil record at all, but if the species were then to undergo neoteny (a form of paedomorphosis in which sexual maturity is reached while in an otherwise juvenile form), then the feature would appear suddenly in the fossil record, despite having evolved gradually.

De Beer worked on paleornithology and general evolutionary theory, and was largely responsible for elucidating the concept of mosaic evolution, as illustrated by his review of the *Archaeopteryx* family in 1954. De Beer's work also included a review of Haeckel's concept of heterochrony, with particular emphasis on its role in avian evolution , especially that of the ratites, in 1956[4] . ***Dedicated to the popularization of science, he received the Kalinga Prize from UNESCO.***

In addition to his scientific works, de Beer also wrote a series of books about Switzerland and the Alps.

Books by Gavin de Beer :

- Growth – 1924
- An introduction to experimental embryology – 1926
- The comparative anatomy, histology and development of the pituitary body-1926
- Vertebrate zoology – 1928
- Early travelers in the Alps – 1930
- Embryology and evolution – 1930 (later editions bore the title Embryos and ancestors)
- Alps and men – 1933
- The elements of experimental embryology-1934 (co-written with Julian Huxley)
- The development of the vertebrate skull – 1937
- Escape to Switzerland – 1945
- Alps and elephants. Hannibal's march – 1955
- The first ascent of Mont Blanc- 1957
- Darwin's journal – 1959
- Charles Darwin: evolution by natural selection – 1963
- Atlas of evolution – 1964
- Homology an unsolved problem – 1971
- Jean-Jacques Rousseau and his world – 1972

Quote :

- Each ontogeny is a fresh creation to which the ancestors contribute only the internal factors by means of heredity.

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3. ^ Brigandt, I. (2006) Homology and heterochrony: the evolutionary embryologist Gavin Rylands de Beer (1899-1972)

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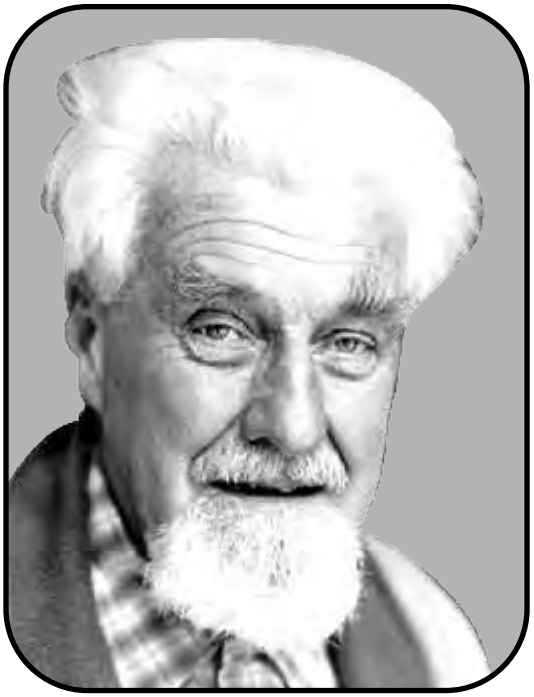
Kalinga Laureate for Popularization of Science – 1969

Dr. Konrad Lorenz, Austria

Nobel Laureate in Physiology or Medicine-1973



[Birth : 7th November, 1903, Vienna, Austria
Died : 27th February, 1989, Vienna]

It is a good morning exercise for a research scientist to discard a Pet hypothesis every day before breakfast. It keeps him young.

...Konrad Lonenz

Konrad Lorenz Biography
Ethology – Imprinting

Konrad Lorenz (Konard Zacharisa Lorenz) was born on November 7, 1903 in Vienna, Austria. As a little boy, he loved animals and had a collection that include fish, dogs, monkeys, insects, ducks, and geese. His interest in animal behaviour was intense.When he was 10 years old, Lorenz became aware of the existence of the Theory of Evolution through reading a book by Wilhelm Bölsche in which he was fascinated by a picture of an Archaeopteryx. Evolution gave him insight- his father had explained that the word “insect” was derived from the notches, the “incisions” between the segments-if reptiles could become birds, annelid worms could develop into insects.

As he grew towards adulthood he wanted to become a paleontologist, however he reluctantly followed his father’s wishes, and studied medicine at the University of Vienna and at Columbia University. He later regarded this compliance to have been in his own best interests as one of his teachers of anatomy, Ferdinand Hochstetter, proved to be a brilliant comparative anatomist and embryologist and a dedicated teacher of the comparative method. Lorenz quickly realized that comparative anatomy and embryology offered a better access to the problems of evolution than paleontology did, and that the comparative method was as applicable to behaviour patterns as it was to anatomical structure. He maintained his deep interest in animal behaviour during his medical studies , making detailed observations of a jackdaw in a diary that was later published in a prestigious journal of ornithology.

He gained a degree in medicine in 1929 and was awarded a doctorate in zoology from the University of Munich in 1936. He had published his famous study of imprinting in young ducklings and goslings in 1935. In these times Lorenz’s work attracted enough notice for the Kaiser – Wilhelmsgesellschaft, (later renamed Max-Planck-Gesellschaft), to decide to found an institute for the physiology of behaviour for himself and another promising researcher named Erich von Holst. In the autumn of 1936 he was introduced to Niko Tinbergen at a symposium held at Leiden in the Netherlands. The two realized that they had much in common in terms of their interest in animal behaviour. In 1939 he was appointed to the Chair of Psychology in Königsberg.

His career as an academic in Austrian and German universities was interrupted by the Second World War. From1941 he served as a doctor in the German army, but became a prisoner of war in 1942. Serving as a doctor under the Russian authorities in Armenia and elsewhere he was not released for repatriation to Austria until 1948.

contd...

Lorenz now found it impossible to get a really worthwhile academic post in Austria but after several months received an offer of a lectureship from the University of Bristol through the intervention of English contacts. He accepted this offer but his receipt of another offer from the Max Planck Institute that would allow him to continue to be associated with a group of friends with whom he was already involved in a smaller scale scientific project caused him to instead relocate, with several of these friends, to Buldern in Westfalia.

From 1961 to 1973 he was the director of the Max Planck Institute for Behaviour Physiology, in Seewiesen, Germany. In 1973 Lorenz, together with Karl von Frisch and Niko Tinbergen, was awarded the Nobel Prize for Physiology or Medicine for their discoveries concerning animal behavioural patterns.

Konard Lorenz is considered to be one of the principal founders of ethology, a branch of science that attempts to gain a deeper insight of behavioral patterns in animals. With Oscar Heinroth (the author of “Die Vögel Mitteleuropas”), he is held to have discovered imprinting, an especially rapid and relatively irreversible learning process that occurs early in the individual’s life where auditory and visual stimuli from an animal’s parents are needed to induce the young to follow their parents. A central concept complementary to imprinting is the innate release mechanism, whereby organisms are genetically predisposed to be especially responsive to certain stimuli such that imprinting will become fixed on the parents.

Some of his views are expressed in the popular book On Aggression (tr. 1966). Here he asserts that human aggressive impulses are to a degree innate, and draws analogies between human and animal territorial behavour. These assertions have engendered considerable controversy.

He also wrote King Solomons Ring which has received a wide and interested readership.

Dr Lorenz died on February, 27, 1989.

❑

Konrad Lorenz –Autobiography

I consider early childhood events as most essential to a man's scientific and philosophical development. I grew up in the large house and the larger garden of my parents in Altenberg. They were supremely tolerant of my inordinate love for animals. My nurse, Resi Führinger, was the daughter of an old patrician peasant family. She possessed a "green thumb" for rearing animals. When my father brought me, from a walk in the Vienna Woods, a spotted salamander, with the injunction to liberate it after 5 days, my luck was in: the salamander gave birth to 44 larvae of which we, that is to say Resi, reared 12 to metamorphosis. This success alone might have sufficed to determine my further career; however, another important factor came in : Selma Lagerlöf's Nils Holgersson was read to me – I could not yet read at that time. From then on, I yearned to become a wild goose and, on realizing that this was impossible, I desperately wanted to have one and, when this also proved impossible, I settled for having domestic ducks. In the process of getting some, I discovered imprinting and was imprinted myself. From a neighbour, I got a one day old duckling and found, to my intense joy, that it transferred its following response to my person. At the same time my interest became irreversibly fixated on water fowl, and I became an expert on their behaviour even as a child.

When I was about ten, I discovered evolution by reading a book by Wilhelm Bölsche and seeing a picture of Archaeopteryx. Even before that I had struggled with the problem whether or not an earthworm was in insect. My father had explained that the word "insect" was derived from the notches, the "incisions" between the segments. The notches between the worm's metameres clearly were of the same nature. Was it, therefore, an insect? Evolution gave me the answer: If reptiles, via the Archaeopteryx, could become birds, annelid worms, so I deduced, could develop into insects. I then decided to become a paleontologist.

At school, I met one important teacher, Philip Heberdey, and one important friend, Bernhard Hellmann. Heberdey, a Benedictine monk, freely taught us Darwin's theory of evolution and natural selection. Freedom of thought was, and to a certain extent still is, characteristic of Austria. Bernhard and I were first drawn together by both being aquarists. Fishing for Daphnia and other "live food" for our fishes, we discovered the richness of all that lives in a Pond. We both were attracted by Crustacea, particularly by Cladocera. We concentrated on this group during the ontogenetic phase of collecting through which apparently every true zoologist must pass, repeating the history of his science. Later, studying the larval development of the brine shrimp, we discovered the resemblance between the Euphyllopod larva and adult Cladocera, both in respect to movement and to structure. We concluded that this group was derived from Euphyllopod ancestors by becoming neotenic. At the time, this was not yet generally accepted by science. The most important; discovery was made by Bernhard Hellmann while breeding the aggressive Cichild Geophagus: a male that had been isolated for some time, would kill any conspecific at sight, irrespective of sex. However, after Bernhard had presented the fish with a mirror causing it to fight its image to exhaustion, the fish would, immediately afterwards, be ready to court a female. In other words, Berhard discovered, at 17 that "action specific potentiality" can be "dammed up" as well as exhausted.

On finishing high school, I was still obsessed with evolution and wanted to study zoology and paleontology. However, I obeyed my father who wanted me to study medicine. It proved to be my good luck to do so. The teacher of anatomy, Ferdinand Hochstetter, was a brilliant comparative

anatomist and embryologist. He also was a dedicated teacher of the comparative anatomy and embryology offered a better access to the problems of evolution than paleontology did, but also that the comparative method was as applicable to behaviour patterns as it was to anatomical structure. Even before I got my medical doctor's degree, I became first instructor and later assistant at Hochstetter's department. Also, I had begun to study zoology at the zoological institute of Prof. Jan Versluys. At the same time I participated in the psychological seminars of Prof. Karl Bühler who took a lively interest in my attempt to apply comparative methods to the study of behaviour. He drew my attention to the fact that my findings contradicted, with equal violence, the opinions held by the vitalistic or "instinctivistic" school of MacDougall and those of the mechanistic or behavioristic school of Watson. Bühler made me read the most imporlant books of both schools, thereby inflicting upon me a shattering disillusionment: none of these people knew animals, none of them was an expert. I felt crushed by the amount of work still undone and obviously devolving on a new branch of science which, I felt, was my responsibility.

Karl Bühler and his assistant Egon Brunswick made me realize that theory of knowledge was indispensable to the observer of living creatures, if he were to fulfill his task of scientific objectivation. My interest in the psychology of perception, which is so closely linked to epistemology, stems from the influence of these two men.

Working as an assistant at the anatomical institute, I continued keeping birds and animals in Altenberg. Among them the jackdaws soon became most important. At the very moment when I got my first jackdaw, Bernhard Hellmannn gave me Oskar Heinroth's book "Die Vögel Mitteleuropas". I realized in a flash that this man knew everything about animal behavour that both, MacDougall and Watson, ignored and that I had believed to be the only one to know. Here, at last, was a scientist who also was an expert! It is hard to assess the influence which Heinroth exerted on the development of my ideas. His classical comparative paper on Anatidae encouraged me to regard the comparative study of behaviour as my chief task in life. Hochstetter generously considered my ethological work as being comparative anatomy of sorts and permitted me to work on it while on duty in his department. Otherwise the papers I produced between 1927 and 1936 would never have been published.

During that period I came to know Wallace Craig. The American Ornitologist Margaret Morse Nice knew about his work and mine and energetically put us into contact. I owe her undying gratitude. Next to Hochstetter and Heinroth, Wallace Craig became my most influential teacher. He criticized my firmly held opinion that instinctive activities were based on chain reflexes. I myself had demonstrated that long absence of releasing stimuli tends to lower their threshold, even to the point of the activity's eruption in vacuo. Craig pointed out that in the same situation the organism began actively to seek for the releasing stimulus situation. It is obviously nonsense, wrote Craig, to speak of a re-action to a stimulus not yet received. The reason why in spite of the obvious spontaneity of instinctive behaviour, I still clung to the reflex theory, lay in my belief, that any deviation from Sherringtonian reflexology meant a concession to vitalism.So, in the lecture I gave in February 1936 in the Harnackhaus in Berlin, I still defended the reflex theory of instinct. It was the last time I did so.

During that lecture, my wife was sitting behind a young man who obviously agreed with what I said about spontaneity, murmuring all the time: "It all fits in, it all fits in." When, at the end of my lecture, I said that I regarded instinctive motor patterns as chain reflexes after all, he hid his face in his hands and moaned: "Idiot, idiot". That man was Erich von Holst. After the lecture, in the commons of the Harnackhaus, it took him but a few minutes to convince me of the untenability of the reflex theory. The lowering thresholds, the eruption of vacuum activities, the independence of motor patterns of external stimulation, in short all the phenomena I was struggling with, not only could be explained,

but actually were to be postulated on the assumption that they were based not on chains of reflexes but on the processes of endogenous generation of stimuli and of central coordination, which had been discovered and demonstrated by Erich von Holst. I regard as the most important break-through of all our attempts to understand animal and human behaviour the recognition of the following fact: the elemental neural organization underlying behavour does not consist of receptor, an afferent neuron stimulating a motor cell and of an afferent neuron stimulating a motor cell and of an effector activated by the latter. Holst's hypothesis which we confidently can make our own, says that the basic central nervous organization consists of a cell permanently producing endogenous stimulation, but prevented from activating its effector by another cell which, also producing endogenous stimulation, exerts an inhibiting effect. It is this inhibiting cell which is influenced by the receptor and ceases its inhibitory activity at the biologically "right" moment. This hypothesis appeared so promising that the Kaiser-Wilhelmsgesellschaft, now renamed Max-Planck-Gesellschaft, decided to found an institute for the physiology of behaviour for Erich von Holst and Myself. I am convinced that if he were still alive, he would be here in Stockholm now. At the time, the war interrupted our plans.

When, in autumn 1936, Prof. Van der Klaauw convoked a symposium called "Instinctus" in Leiden in Holland, I read a paper on instinct built up on the theories of Erich von Holst. At this symposium I met Niko Tinbergen and this was certainly the event which, in the course of that meeting, brought the most important consequences to myself. Our views coincided to an amazing degree but I quickly realized that he was my superior in regard to analytical thought as well as to the faculty of devising simple and telling experiments. We discussed the relationship between spatially orienting responses (taxes in the sense of Alfred Kühn) and releasing mechanism on one hand, and the spontaneous endogenous motor patterns on the other. In these discussions some conceptualizations took form which later proved fruitful to ethological research. None of us knows who said what first, but it is highly probable that the conceptual separation of taxes, innate releasing mechanisms and fixed motor patterns was Tinbergen's contribution. He certainly was the driving force in a series of experiments which we conducted on the egg-rolling response of the Greylag goose when he stayed with us in Altenberg for several months in the summer of 1937.

The same individual geese on which we conducted these experiments, first aroused my interest in the process of domestication. They were F_1 hybrids of wild Greylags and domestic geese and they showed surprising deviation from the normal social and sexual behaviour of the wild birds. I realized that an overpowering increase in the drives of feeding as well as of copulation and a waning of more differentiated social instincts is characteristic of very many domestic animals. I was frightened-as I still am-by the thought that analogous genetical processes of deterioration may be at work with civilized humanity. Moved by this fear, I did a very ill-advised thing soon after the Germans had invaded Austria: I wrote about the dangers of domestication and, in order to be understood, I couched my writing in the worst of nazi-terminology. I do not want to extenuate this action. I did, indeed, believe that some good might come of the new rulers. The precedent narrow-minded catholic regime in Austria induced better and more intelligent men that I was to cherish this naive hope. Practically all my friends and teachers did so, including my own father who certainly was a kindly and humane man. None of us as much as suspected that the word "selection", when used by these rulers, meant murder. I regret those writings not so much for the undeniable discredit they reflect on my person as for their effect of hampering the future recognition of the dangers of domestication.

In 1939 I was appointed to the Chair of Psychology in Köningsberg an this appointment came about through the unlikely coincidence that Erich von Holst happened to play the viola in a quartette

which met in Göttingen and in which Eduard Baumgarten played the first violin. Baumgarten had been professor of philosophy in Madison, Wisconsin. Being a pupil of John Dewey and hence a representative of the pragmatist school of philosophy, Baumgarten had some doubts about accepting the chair of philosophy in Köningsberg-Immanuel Kant's chair-which had just been offered to him. As he knew that the chair of psychology was also vacant in Koningsberg, he casually asked Erich von Holst whether he knew a biologically oriented psychologist who was, at the same time, interested in theory of knowledge. Holst knew that I represented exactly this rather rare combination of interests and proposed me to Baumgarten who, together with the biologist Otto Koehler and the botanist Kurt Mothes-now president of the Academia Leopoldina in Halle-persuaded the philosophical faculty in Köningsberg of putting me, a zoologist, in the psychological chair. I doubt whether perhaps the faculty later regretted this choice, I myself, at any rate, gained enormously by the discussions at the meetings of the Kant-Gesellschaft which regularly extended late into the night. My most brillant and instructive opponents in my battle against idealism were the physiologist H.H.Weber, now of the Max-Planck-Gesellschaft, and Otto Koehler's late first wife Annemarie. It is to them that I really owe my understanding of Kantian philosophy-as far as it goes. The outcome of these discussions was my paper on Kant's theory of the á priori in the view of Darwinian biology. Max Planck himself wrote a letter to me in which he stated that he thoroughly shared my views on the relationship between the phenomenonal and the real world. Reading that letter gave me the same sort of feeling as hearing that the Nobel Prize had been awarded to me. Years later that paper appeared in the Systems Year Book translated into English by my friend Donald Campbell.

In autumn 1941 I was recruited into the German army as a medical man. I was lucky to find an appointment in the department of neurology and psychiatry of the hospital in Posen. Though I had never practised medicine, I knew enough about the anatomy of the nervous system and about psychiatry to fill my post. Again I was lucky in meeting with a good teacher, Dr. Herbert Weigel, one of he few psychiatrists of the time who took psychoanalysis seriously. I had the opportunity o get some first-hand knowledge about neurosis, particularly hysteria, and about psychosis, particularly schizophrenia.

In spring 1942 I was sent to the front near Witebsk an two months later taken prisoner by the Russians. At first I worked in a hospital in Chalturin where I was put in charge of a department with 600 beds, occupied almost exclusively by cases of so called field polyneuritis, a form of general inflammation of nervous tissues caused by the combined effects of stress, overexertion, cold and lack of vitamins. Surprisingly, the Russian physicians did not know this syndrome and believed in the effects of diphteria – an illness which also causes a failing of all reflexes. When this hospital was broken up I became a camp doctor, first in Oritschi and later in a number of successive camps in Armenia. I became tolerably fluent in Russian and got quite friendly with some Russians, mostly doctors. I had the occasion to observe the striking parallels between the psychological effects of nazi and of Marxist education. It was then that I began to realize the nature of indoctrination as such.

As a doctor in small camps in Armenia I had some time on my hand and I started to write a book on epistemology, since that was the only subject for which I needed no library. The manuscript was mainly written with potassium permanganate solution on cement sacking cut to pieces and ironed out. The soviet authorities encouraged my writing, but just when it was about finished, transferred me to a camp in Krasnogorsk near Moscow, with the injunction to type the manuscript and send a copy to the censor. They promised I should be permitted to take a copy home on being repatriated. The prospective date for repatriation of Austrians was approaching and I had cause to fear that I should be kept back because of my book .

One day, however, the commander of the camp had me called to his office, asked me, on my word of honor, whether my manuscript really contained nothing but unpolitical science. When I assured him that this was indeed the case, he shook hands with me and forthwith wrote out a "propusk", an order, which said that I was allowed to take my manuscript and my tame starling home with me. By word of mouth he told the convoy officer to tell the next to tell the next and so on, that I should not be searched. So I arrived in Altenberg with manuscript and bird intact. I do not think that I ever experienced a comparable example of a man trusting another man's word. With a few additions and changes the book written in Russia was published under the title "Die Rückseite des Spiegels". This title had been suggested by a fellow prisoner of war in Erivan, by name of Zimmer.

On coming home to Austria in February 1948, I was out of a job and there was no promise of a chair becoming vacant. However, friends rallied from all sides. Otto Storch, professor of zoology, did his utmost and had done so for my wife even before I came back. Otto König and his "Biologische Station Wilhelminenberg", received me like a long lost brother and Wilhelm Marinelli, the second zoologist, gave me the opportunity to lecture at his "Institute für Wissenschaft und Kunst". The Austrian Academy of Sciences financed a small research station in Altenberg with the money donated for that purpose by the English poet and writer J.B. Priestley. We had money to support our animals, no salaries but plenty of enthusiasm and enough to eat, as my wife had given up her medical practice and was running her farm near Tulln. Some remarkeable young people were ready to join forces with us under these circumstances. The first was Wolfgang Schleidt, now professor at Garden University near Washington. He built his first amplifier for supersonic utterances of rodents from radio-receivers found on refuse dumps and his first terrarium out of an old bedstead of the same provenance. I remember his carting it home on a wheel-barrow. Next came Ilse and Heinz Prechti, now professor in Groningen, then lrenäus and Eleonore Eibl-Eibesfeldt, both lady doctors of zoology and good scientists in their own right.

Very soon the international contact of ethologists began to get re-established. In autumn 1948 we had the visit of Professor W.H. Thorpe of Cambridge who had demonstrated true imprinting in parasitic wasps and was interested in our work. He predicted, as Tinbergen did at that time, that I should find it impossible to get an appointment in Austria. He asked me in confidence whether I would consider taking on a lectureship in England. I said that I preferred, for the present, to stick in Austria. I changed my mind soon afterwards: Kari von Frisch who left his chair in Graz, Austria, to go back to Munich, proposed me for his successor and the faculty of Graz unanimously concurred. When the Austrian Ministry of Education which was strictly Catholic again at this time, flatly refused Frisch's and the faculty's proposal, I wrote two letters to Tinbergen and to Thorpe, that I was now ready to leave home. Within an amazingly short time the University of Bristol asked me whether I would consider a lectureship there, with the additional task of doing ethological research on the waterfowl collection of the Severn Wildfowl Trust at Slimbridge. So my friend Peter Scott also must have had a hand in this. I replied in the affirmative, but, before anything was settled, the Max-Planck-Gesellschaft intervened offering me a research station adjunt to Erich von Holst's department. It was a hard decision to take; finally I was swayed by the consideration that, with Max Planck, I could take Schleidt, Prechtl and Eibl with me. Soon afterwards, my research station in Buldern in Westfalia officially joined to Erich von Holst's department in a newly-founded "Max-Planck-Institute für Verhaltensphysiologie". Erich von Holst convoked the international meeting of ethologists in 1949. With the second of these symposia, Erich von Holst and I celebrated the comingtrue of our dream in Buldem in autumn 1950.

Returning to my research work, I at first confined myself to pure observation of waterfowl and of fish in order to get in touch again with real nature from which I had been separated so long. Gradually, I began to concentrate on the problems of aggressivity, of its survival function and on the mechanisms counteracting its dangerous effects. Fighting behaviour in fish and bonding behaviour in wild geese soon became the main objects of my research. Looking again at these things with a fresh eye, I realized how much more detailed a knowledge was necessary, just as my great co-laureate Karl von Frisch found new and interesting phenomena in his bees after knowing them for several decades, so, I felt, the observation of my animals should reveal new and interesting facts. I found good coworkers and we all are still busy with the same never-ending quest.

A major advance in ethological theory was triggered in 1953 by a violent critique by Daniel D. Lehrmann who impugned the validity of the ethological concept of the innate. As Tinbergen described it, the community of ethologists was humming like a disturbed bee-hive. At a discussion arranged by Professor Grassé in Paris, I said that Lehrmann, in trying to avoid the assumption of innate knowledge, was inadvertently postulating the existence of an "innate school-marm". This was meant at a reduction to the absurd and shows my own error: it took me years to realize that this error was identical with that committed by Lehrmann and consisted in conceiving of the "innate" and of the "learned" as of disjunctive contradictory concepts. I came to realize that, of course, the problem why learning produces adaptive behaviour, rests exclusively with the "innate school-marm", in other words with the phylogenetically programmed teaching mechanism. Lehrmann came to realize the same and on this realization we became friends. In 1961 I published a paper "Phylogenetische Anpassung und adaptive Modifikation des Verhaltens", which I later expanded into a book called "Evolution and Modification of Behaviour" (Harvard University Press, 1961).

Until late in my life I was not interested in human behaviour and less in human culture . It was probably my medical background that aroused my awareness of the dangers threatening civilized humanity. It is sound strategy for the scientist not to talk about anything which one does not know with certainty. The medical man, however, is under the obligation to give warning whenever he sees a danger even if he only suspects its existence. Surprisingly late, I got involved with the danger of man's destruction of his natural environment and of the devastating vicious circle of commercial competition and economical growth. Regarding culture as a living system and considering its disturbances in the light of illnesses led me to the opinion that the main threat to humanity's further existence lies in that which may well be called mass neurosis. One might also say that the main problems with which humanity is faced, are moral and ethical problems.

Todate I have just retired from my directorship at the Max-Planck-Institut für Verhaltensphysiologie in Seewiesen, Germany and am at work building up a department of animal sociology pertaining to the Institute für Vergleichende Verhaltensforschung of the Austrian Academy of Science.

1. According of Professor Wolfgang Schleidt, on July 22 1998, there is no Garden University. He was professor at the University of Maryland, College Park Campus from 1965 to 1985.

   From Les Prix Nobel 1973.

   Konard Lorenz died on February 27, 1989.

Truth in Science can be defined as the working hypothesis best suited to open the way to the next better one.

…Konrad Lonenz

Kalinga Laureate for Popularization of Science – 1970

Dr. Margaret Mead, USA

[Born : 16th December, 1901, Philadelphia, USA
Died : 15th November, 1978, New York, USA]

- **Never doubt that a small group of thoughtful, committed citizens can change the world; Indeed, it is the only thing that ever has.**
- **Always remember that you are absolutely unique. Just like everyone else.**
- **Life in the twentieth Century is like a Parachute Jump – you have to get it right the first time.**

…Margaret Mead

Margaret Mead
A Biographical Profile

Margaret Mead (December 16, 1901, Philadelphia-November 15, 1978, New York City) was an American Cultural Anthropologist.

Early Years :

Mead was the first of five children, born into a Quaker family, [1] (http://www.litweb.net/biography/7/ Margaret_Mead.html) raised near Doylestown, Pennsylvania by her university professor father, Edward Sherwood Mead, and social-activist mother, Emily Fogg Mead.[2] (http:/www.loc. gov/exhibits/mead/mead-shaping.html) Margaret studied one year, 1919 at DePauw University, then transferred to Barnard College where she earned her Bachelor's Degree in 1923. She studied with Professor Franz Boas and his assistant Dr. Ruth Benedict at Columbia University before earning her Master's Degree in 1924. [3] (http://www.britannica.com/women/article-9051668) Mead set out in 1925 to do fieldwork in Polynesia. [4] (http://www.thegreatlecturelibrary.com/index.php?select=speaker&data=988) In 1926, she joined the American Museum of Natural History, New York City, as assistant curator. [5] (http://www.webster.edu/~woolflm/margaretmead.html) She received her Ph.D from Columbia University in 1929 [6] (http://www.kirjasto.sci.fi/mmead.htm)

Career :

During World War II. Mead served as executive secretary of the National Research Council's Committee on Food Habits. She served as curator of ethnology at the American Museum of Natural History from 1946 to 1969. She taught at Columbia University as adjunct professor starting in 1954. Following the example of her instructor Ruth Benedict, mead concentrated her studies on problems of child rearing, personality, and culture. (Source : The Columbia Enchyclopedia, Fifth Edition, 1993) She held various positions in the American Association for the Advancement of Science, notably president in 1975 and chair of the executive committee of the board of directors in 1976. [7] (http://www.depts.drew.edu/wmst/corecourses/wmst111/ timeline bios/Mmead.htm)

Although considered a pioneering and influential anthropologist, there has been academic disagreement - notably on the part of Derek Freeman- with certain findings in her first books, Coming of Age in Samoa (1928), based on research she conducted as a graduate student, and with her published works based on time with the Sepik and on the island of Tau in the Manua Group of Islands.

margaret Mead was married three times; first to Luther Cressman (a theological student during his marriage to Mead; later an anthropologist himself), and then to two fellow anthropologists, Reo Fortune and Gregory Bateson, with whom she had a daughter (Mary Catherine Bateson, who also became an anthropologist). Her grand daughter, Sevanne Margaret Kassarjian, is a stage and television actress who works professionally under the name Sevanne Martin. Mead Readily acknowledged that she had been devastated when Bateson left her and that she remained in love with him to her life's end, keeping his photography by her bediside wherever she traveled. Mead also had an exceptionally close relationship with Ruth Benedict. Mead's daughter Catherine, in her memoir of her parents *With a Daughter's Eye,* implies that the relationship between Benedict and

Mead my have contained an erotic element (see also Lapsley 1999). While Margaret Mead never identified herself as lesbian, the details of her relationship with Benedict have led others to identify her thus; in her writings she proposed that it is to be expected that individuals' sexual orientation may change throughout their lives.

Coming of Age in Samoa and the Mead-Freeman controversy :

In the foreword to *Coming of Age in Samoa,* Mead's advisor, Franz Boas, wrote of its significance that

Courtesy, modesty, good manners, conformity to definite ethical stanards are universal but what constitutes courtesy, modesty, very good manners and definite ethical standards is not universal. It is instructive to know that standards differ in the most unexpected ways.

Boas went on to point out that at the time of publication, many Americans had begun to discuss the problems faced by young people (particularly women) as they pass through adolescence as "unavoidable periods of adjustment." Boas felt that a study of the problems faced by adolescents in another culture would be illuminating.

And so, as Mead herself described the goal of her research: "I have tried to answer the question which sent me to Samoa : Are the disturbances which vex our adolescents due to the nature of adolescence itself or to the civilization ? Under different conditions does adolescence present a different picture ?" To answer this question, she conducted her study among a small group of Samoans-a village of 600 people on the island of Ta'u in which she got to know, lived with, observed, and interviewed (through an interpreter) sixty-eight young women between the ages of 9 and 20. She concluded that the passage from childhood to adulthood (aqdolescence) in Samoa was a smooth transition and not marked by the emotional or psychological distress, anxiety, or confusion seen in the United States.[I]

As Boas and Mead expected, this book upset many Westerners when it first appeared in 1928. Many American readers felt shocked by her observation that young Samoan women deferred marriage for many years while enjoying casual sex, but eventually married, settled down, and successfully reared their own children.

In 1983, five years after Mead had died, Derek Freeman published *Margaret Mead and Samoa : The Making and Unmaking of an Anthropological Myth,* in which he challenged all of Mead's major findings. Freeman based his critique on his own four years of field experience in Samoa and on recent interviews with Mead's surviving informants. The argument hinged on the place of the taupou system in Samoan society. According to Mead, the taupou system is one of institutionalized virginity for young women of high rank, but is exclusive to women of high rank. According to Freeman, all Samoan women emulated the taupou system and Mead's informants denied having engaged in casual sex as young women, and claimed that they had lied to Mead (see Freeman 1983).

After an initial flurry of discussion, most anthropologists concluded that the truth would probably never be known.

The Mead partisans have asserted that Freeman's critique is highly questionable.

First, these critics have speculated that he waited until Mead died before publishing his critique so that she would not be able to respond. However, when Freeman died in 2001, his obituary in the New York Times pointed out that Freeman tried to publish his criticism of Mead as early as 1971, but that American publishers rejected his manuscript. In 1978, Freeman sent a revised manuscript to Mead. But Mead, who was ill and died a few months later, did not respond.

Second, Freeman's Critics point out that by the time Freeman arrived on the scene Mead's original informants were old women,

grandmothers, and had converted to Christianity. They further allege that Samoan culture had changed considerably in the decades following Mead's original research, that after intense missionary activity many Samoans had come to adopt the same sexual standards as the Americans who were once so shocked by Meads book. They suggested that such women, in this new context, were unlikely to speak frankly about their adolescent behaviour. (In a gesture which could be read to support either position, one of Freeman's interviewees gave her born-again faith as the reason for admitting to what she now claimed was a past deception.) Further, they suggested that these women might not be as forthright and honest about their sexuality when speaking to an elederly man as they would have been speaking to a woman near their own age.

Some anthropologists also criticized Freeman on methodological and empirical grounds. For example, they claimed that Freeman had conflated publicly articulated ideals with behavioral norms - that is, while many Samoan women would admit in public that it is ideal to remain a virgin, in practice they engaged in high levels of premarital sex and boasted about their sexual affairs amongst themselves (see Shore 1982 : 229-230). Freeman's own data documented the existence of premarital sexual activity in Samoa. In a western Samoan village he documented that 20% of 15 year-olds, 30% of 16 year-olds, and 40% of 17 year-olds had engaged in premarital sex (1983: 238-240). In 1983, the American Anthropological Association passed a motion declaring Freeman's *Margaret Mead and Samoa* "poorly written, unscientific, irresponsible and misleading." In the years that followed, anthropologists vigorously debated these issues but generally supported the critique of Freeman's work (see Appell 1984, Brady 1991, Feinberg 1988, Leacock 1988, Levy 1984, Marshall 1993, Nardi 1984, Patience and Smith 1986, Paxman 1988, Scheper-Hughes 1984, Shankman 1996, and Young and Juan 1985).

Freeman continued to argue his case in the 1999 publication of *The Fateful Hoaxing of Margaret Mead : A Historical Analysis of Her Samoan Research,* introducing new information in support of his arguments.

After Freeman died, the New York Times concluded that "many anthropologists have agreed to disagree over the findings of one of the science's founding mothers, acknowledging both Mead's pioneering research and the fact that she may have been mistaken on details."

Research in Other Societies :

Another extremely influential book by Mead was *Sex and Temperament in Three Primitive Societies.* This became a major cornerstone of the women's liberation movement, since in claimed that females are dominant in the Tchambuli (now spelled Chambri) Lake region of Papua New Guinea (in the western Pacific) without causing any special problems. The lack of male dominance may have been the result of the Australian administration's outlawing of warfare. According to contemporary research, males are dominant throughout Melanesia (althought some believe that female witches have special powers). Others have argued that there is still much cultural variation throughout Melanesia, and especially in the large island of New Guinea. Moreover, anthropologists often overlook the significance of networks of political influence among females. The formal male-dominated institutions typical of some high-population density areas were not, for example, present in the same way in Oksapmin, West Sepik Province, a more sparsely populated area. Cultural patterns there were different from, say, Mt. Hagen. They were closer to those described by Mead.

Mead stated that the Arapesh people wee pacifists, although she noted that they do on occasion engage in warfare. Meanwhile, her observations about the sharing of garden plots amongst the Arapesh, the egalitarian emphasis in child-rearing, and her documentation of

predominantly peaceful relations among relatives hold up. These descriptions are very different from the "big-man" displays of dominance that were documented in more stratified New Guinea cultures - e.g. ;by Andrew Strathern. They are, indeed, as she wrote, a cultural pattern.

When margaret Mead described her research to her students at Columbia University, she put succinctly what her objectives and her conclusions were. A first-hand account by an anthropologist who studied with Mead in the 60s and 70s provides the following information :

1. Mead tells of *Sex and Temperament in Three Primitive Societies.* "She explained that nobody knew the degree to which temperament is biologically determined by sex. So she hoped to see whether there were cultural or social factors that affected temperament. Were men inevitably aggressive / Were women inevitably "homebodies" ? It turned out that the three cultures she lived with in New Guinea were almost a perfect laboratory - for each had the variables that we associate with measuline and feminine in an arrangement differnt from ours. She said this surprised her, and wasn't what she was trying to find . It was just there.

- "Among the Arapesh, both men and women were peaceful in temperament and neither men nor women made war."
- "Among the Mundugumor, the opposite was true: both men and women were warlike in temperament.
- "And the Tchambuli were different from both. The men 'primped' and spent their time decorating themselves while the women worked and were the practical ones-the opposite of how it seemed in early 20th century America."

2. Mead tells of *Growing Up in New Guinea.* "Margaret Mead told us how she came to the research problem on which she based her *Growing Up in New Guinea.* She reasoned as follows: If primitive adults think in an animistic way, as Piaget says our children do, how do primitive children think ?

- In her research on Manus Island of New Guinea, she discovered that 'primitive' children think in a very practical way and begin to think in terms of spirits etc. as they get older.

Mead also researched the European shtetl, Financed by the American Jewish Committee. Although her interviews at Columbia University with 128 European born Jews disclosed a wide variety of family structures and experiences, the publications resulting from this study and the many citations in the popular media resulted in the Jewish mother stereotype, intensely loving but controlling to the point of smothering, and engendering enormous guilt in her children through the enormous suffering she professed to undertake for their sakes.[2]

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Source :

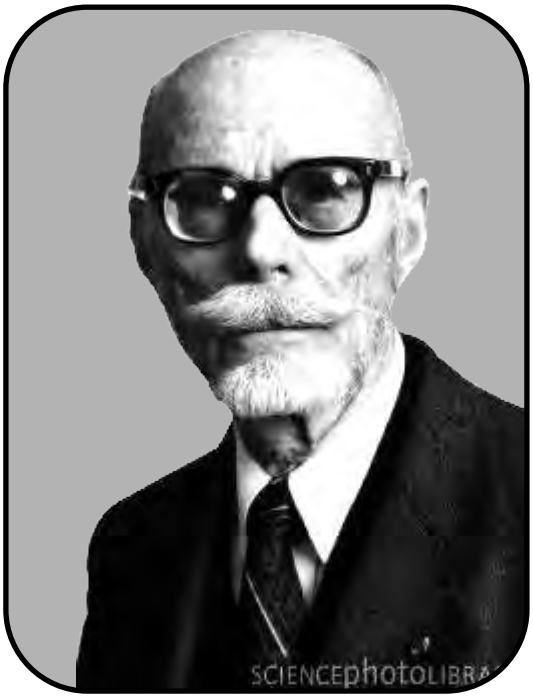
http://en.wikipedia.org/wiki/Margaret_Mead

- **I learned the value of hard work by working hard.**
- **Mothers are a biological necessary; fathers are a social invention.**
- **Women want Mediocre men, and men are working to become as mediocre as possible.**

…Margaret Mead

Kalinga Laureate for Popularization of Science – 1971

Dr. Pierre Victor Auger, France



[Born : 14th May, 1899, Paris
Died : 25th December, 1993, Paris]

Energy with the Earth Atmosphere can be considered like discoverer of gigantic particle rains generated by the interaction of cosmic rays of Extreme Discharge

...Pierre Auger

Pierre Auger: The Pioneering Work

Pierre Victor Auger

French Physicist (1899-1993)

Auger was born in Paris and educated there at the Ecole Normale Supérieure, where he obtained his doctorate in 1926. He was later appointed to the staff of the University of Paris and after serving there as professor of physics from 1937 became director of higher education for France in 1945. From 1948 until 1960 he was director of the science department of UNESCO; he left UNESCO to become president of the French Space Commission but in 1964 he took the post of director-general of the European Space and Research Organization, a post he retained until his retirement in 1967.

Auger worked mainly on nuclear physics and cosmic rays. In 1925 he discovered the Auger effect in which an excited atom emits an electron (rather than a photon) in reverting to a lower energy state. In 1938 Auger made a careful study of 'air showers', a cascade of particles produced by a cosmic ray entering the atmosphere and later known as an Auger shower. Auger had an interest in the popularization of science. He also published volumes of poetry.

The Auger Observatory experiment was named after Pierre Victor Auger (Paris, 14/5/1899-Paris, 25/12/1993) who can be considered as the discoverer of the giant airshowers generated by the interaction of very high-energy cosmic rays with the earth's atmosphere. A few dates on the life and works of Pierre Auger [excerpts from a biographical note written by himself in 1971]:

- **1919** : enters the Ecole Normale Supérieure de Paris in the biology group but with interest in atomic physics.
- **1922-1942** : devotes his professional life to experimental physics in the fields of :
  - Atomic physics (Photoelectric effect);
  - Nuclear physics (slow neutrons);
  - Cosmic ray physics (atmospheric air-showers)
- **1939-1941:** is in charge of the organization of a service of documentation for the laboratories working for the defence.
- **1941** : leaves France and enters the "Forces Françaises Libres" (Free French Forces). Participates in the creation of a French-British-Canadian group on atomic energy research (becomes head of this department in Montreal).
- **1944** : joins the operational groups in London.
- **1945** : becomes Chairman of the Department of Universities for the French government. Many of his reforms at this position are still operational in the French system. In particular, he participates in the creation of the French Atomic Energy Commission (CEA).

- **1948-1959 :** Director of the Department of Sciences for the UNESCO. He strongly campaigns for the creation of international research organisms. He is one of the forefathers of CERN whose construction begins in 1953.
- **1959-1964 :** resumes his activities in cosmic ray physics with a shift from nuclear physics to astrophysics. Creates and chairs the still existing CNES (National Center for Space Physics) and other similar organisms (COPERS, CERS-ESRO).
- **1964-1967:** chairs ESRO, an international organisms of cooperation between 10 european countries for satellite projects.
- **1967-1970** (his retirement date)**:** Director of the "Centre des Faibles Radioactivités"(weak radiations used in particular for datation techniques).

Following are the reproductions of the original articles by Pierre Auger and collaborators on the first hints of the existence of ultra high energy cosmic rays by the observation of large air-showers.

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Professor Auger's outstanding professional career covered Physics, Nuclear Power & Space Research, Organization and Administration of Research, Diplomatic Services & Pedagogics but also extended in to Modern Biology, Humanistic Sciences, Poetry & Arts. He was awarded with the most Prestigious Gaede – Langmuir Award "For establishing the Fundamental Principle of Auger Spectroscopy which has led to the most widely used surface analysis technique of importance to all aspects of Vacuum Science & Technology".

Kalinga Laureate for Popularization of Science – 1972

Dr. Philip H. Abelson, USA

[Born : 27th April, 1913, Tacoma, WA, USA
Died : 1st August, 2004, Maryland, USA]

The imaginative and original mind need not be overawed by the imposing body of Present knowledge or by the complex and costly paraphernalia which today surround much of scientific activity. The great shortage in science now is not opportunity, manpower, money or laboratory space. What is really needed is more of that healthy skepticism which generates the Key ideas - the liberating concept.

....Philip H. Abelson

Philip H. Abelson

Philip Hauge Abelson (April 27, 1913 - August 1, 2004) was an American physicist, editor of scientific literature, and science writer.

Philip Abelson was born in 1913 in Tacoma, Washington. He attended Washington State University where he received degrees in Chemistry and Physics, and the University of California, Berkeley, where he earned his Ph.D. in Nuclear Physics. As a young physicist, he worked for Ernest Lawrence at the University of California, Berkeley. He was among the first American scientists to verfiy Nuclear Fission in an article submitted to the Physical Review in February of 1939 (http://prola.aps.org/abstract/PR/v55/i4/p418_1). In addition, he collaborated with Nobel Prize winner Luis Alvarez in early nuclear research, and was the co-discoverer of the element Neptunium on June 8, 1940 [with Edwin McMillan, who was awarded the Nobel Prize for the discovery].

He was a key contributor to the Manhattan Project during World War II. Although Abelson was not formally associated with the atom bomb project, the Liquid Thermal Diffusion isotope separation technique that he invented was used in the S-50 plant in Oak Ridge, Tennessee, and proved a critical step in creating sufficient fuel for the weapon.

After the war, he turned his attention under the guidancne of Ross Gunn (http://www.nap.edu/readingroom/books/biomems/rgunn.html) to applying nuclear power to naval propulsion. While not written at an engineering-design level, he wrote the first physics report detailing how a nuclear reactor could be installed in a submarine, providing both propulsion and electrical power. His report anticipated the nuclear submarine's role as a missile platform. This concept was later supported by Admiral Hyman G. Rickover and others. Under Rickover's relentless leadership, concept became reality in the form of USS Nautilus, the world's first nuclear-powered submarine.

From 1951 until 1971 he served as the director of the Carnegie Institution of Washington's Geophysical Laboratory, and served as president of the Institution from 1971 to 1978. From 1962 to 1984 he was editor of Science magazine, published by the American Association for the Advancement of Science (AAAS), and served as its acting Executive Officer in 1974, 1975 and 1984. From 1972 until 1974 he served as President of the American Geophysical Union (AGU).

During the 1970's he became interested in the problem of world energy supplies. Books on the topic include "Energy for Tomorrow" (1975), from a series of lectures at the University of Washington, and "Energy II : Use Conservation and Supply". He pointed out the possibilities of mining the Atabascan tar sands, as well as shale oil in the Colorado Rockies. In addition he urged conservation and a change of attitude towards public transit. Philip H. Abelson (1975). Energy For Tomorrow.

Perhaps his most famous work from this time period is an editorial entitled "Enough of Pessimism" ("enough of pessimism, it only leads to paralysis and decay"). This became the title of a 100 essay collection. Philip H. Abelson (1985). Enough of Pessimism.

After 1984, he remained associated with the magazine. Some have claimed him to be an early skeptic of the case for global warming on the basis of a lead editorial in the magazine dated March 31, 1990 in which he wrote, "If the global warming situation is analyzed applying the customary standards of scientific inquiry one must conclude that there has been more hype than solid fact." However, in 1977 in the foreword for a US National

Research Council, Energy and Environment report he wrote, "What should the atmospheric carbon dioxide content be over the next century or two to achieve an optimum global climate ?", implying a level of connection between CO_2 and climate that would put him outside today's skeptic camp.

Dr. Abelson received many distinguished awards, including The President's National Medal of Science, the National Science Foundation's Distinguished Achievement Award, the American Medical Association's Scientific Achievement Award, the Distinguished Civilian Service Medal and the Waldo E. Smith Medal in 1988. In 1992 he was awarded the Public Welfare Medal, the National Academy of Science's highest honor.

Dr. Abelson's wife Neva Abelson (1910-2000) was a distinguished research physician who co-discovered the life-saving Rh blood factor test (with L.K. Diamond). Their daughter, Dr. Ellen Abelson Cherniavsky, now retired, worked as an aviation researcher at The MITRE Corporation in Virginia.

Philip Abselson died on August 1,2004 from respiratory complications following a brief illness.

Source :

"http://en.wikipedia.org/wiki/Philip_Abelson"

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Philip H. Abelson
A Biographical Profile

Scientist and Editor

[Born April 27, 1913, Tacoma, WA, U.S.A.
Died : August 1, 2004]

Philip H. Abelson served as editor of Science magazine from 1962 to 1984. As editor, he implemented more efficient peer review procedures for scientific papers submitted to the magazine and encouraged a more active style of science reporting that included broader coverage of science and policy issues. These records include correspondence, memos, editorials and minutes of editorial board meetings. Among his scientific accomplishments collaborated in the discovery of neptunium (element 93), devised a method for large-scale synthesis of enriched uranium for use as a power source in submarines, and was director of the Carnegie Institution of Washington's Geophysical laboratory from 1953 to 1971. A number of Abelson's personal papers, including speeches and other materials not related to his work as editor of Science, were given to the Library of Congress in early 2001.

Abelson made contributions to the fields of nuclear physics, chemistry, microbiology, orgnanic geochemistry, and to studies of the origin of life. He also wrote many items on science policy.

As a graduate student in 1939 at the Radiation Laboratory, University of California, Berkeley, Abelson was the first American scientist to identify products of uranium fission. These included three radioactive isotopes of antimony, six of tellurium, and four of iodine. In 1940 Abeson's attention focused on some work that E.M. McMillan had done the previous year on neutron irradiation of thin layers containing uranium. McMillan had found that most of the fission products escaped from the layer, but that a nonrecoiling 2.3 - day beta emitter remained. Emilio Segrè had postulated that the activity followed the chemistry of the ordinary rare earths and that the substance was not a transuranic. An alternative explanation occurred to Abelson. He felt that the activity was due to element 93, but that instead of being an ekarhenium, element 93 was a member of a new rare-earth series. Pointing out that cerium could exist in two valence states, Abelson thought that the easiest way to demonstrate the existence of element 93 might be by its response to oxidzing and reducing agents. He conducted some experiments at the department of terrestrial magnetism of the Camegie Institution of Washington with encouraging but not clear-cut results. The intensities there did not permit use of thin-foil technique.

Abelson went to Berkeley and discussed his ideas with McMillan. The two scientists then collaborated in the discovery of element 93 (neptunium). McMillan prepared and irradiated some of his thin layer material. Within a day Abelson demonstrated that the 2.3-day activity could exist in at least two valence states. In the reduced state the fluoride was precipitated with a cerium carrier. However, in the presence of fluride and bromate in acid solution, the activity remained in solution while fission-product rare earths precipitated.

Abelson also learned that element 93 is more readily reduced that uranium. Thus he was able to show by repeated precipitations that the 2.3-day activity is the daughter of a 23-minute uranium activity. The total duration of the research plus preparation of a letter to the editor of the Phisical Review was 5 days.

In 1940 nuclear physicists were already talking of the possibility of nuclear reactors and atomic weapons. There was uncertainty whether a chain reaction could be established using natural uranium. Uranium enriched in ^{235}U seemed the key to many possibilities; partial enrichment of ^{235}U would guarantee a successful chain reaction. One application advocated by Ross Gunn of the Naval Research laboratory was as a source of power for submarines.

The prospects for large-scale isotope separation were dim. At that time only microgram quantities of uranium had been fractionated. Few uranium chemicals were available. Abelson devised a method for large-scale synthesis of UF_6 from UF_4 and produced the first 100 kilograms of the substance. He discovered that the uranium isotopes could be partially separated by liquid thermal diffusion. The process was conducted in an annular space with cold wall at 70°C and hot wall at 286°C, with columns 14 meters long. In a single column a maximum enrichment from 0.7 percent ^{238}U to 1.4 percent ^{235}U was obtained. By mid-1943 more than 100 kilograms of partially fractionated ^{235}U had been obtained, by far the largest amount of fractionated uranium available at that time. A small pilot plant at the Naval Research Laboratory, then a larger pilot plant at the Philadelphia Naval Base, and finally a 2100-column plant at Oak Ridge, TN, were built. The partially enriched uranium (0.85 percent ^{235}U) was used as feed for the electromagnetic separation plant, which in turn produced the ^{235}U employed in one of the first atomic bombs.

After World War II Abelson led a small group that prepared a feasibility report (dated Mar. 28, 1946) on the atomic submarine. The group showed that a nuclear reactor, shielding, and associated propulsion equipment could be substituted for the then conventional equipment and that a very useful submarine might result. Amoung the advantages cited for an atomic submarine was long range at high speed under water. The report also stated that "this fast submarine will serve as an ideal carrier and launcher of rocketed atomic bombs."

In 1946 Abelson began a new scientific career in biophysics. The new venture was a consequence of discussions involving M.A. Tuve, then recently appointed director of the department of terrestrial magnetism of the Carnegie Institution of Washington. Abelson and Tuve concluded that one of the great future frontiers lay in the application of physical methods and theory to biological problems. Subsequently, Abelson was appointed chairperson of a biophysics section, which soon included four physicists and a biologist. The group exploited opportunities created by availability of radioactive tracers, notably ^{14}C. Using tagged glucose and other tagged compounds, including amino acids and CO_2 and employing the technique of isotopic competition, Abelson outlined many of the pathways of the biosynthesis of amino acids in micro-orgranisms.

In 1953 Abelson became director of the Geophysical Laboratory of the Carnegie Institution of Washington and embarked on still another career as one of the nation's pioneers in organic geochemistry. Among his discoveries was the identification of original amino acids preserved in fossils, especially shells. He found alanine, glutamic acid, glycine, leucine, and valine in many old fossils. Subsequently, with T.C. Hoering and Patrick Parker, Abelson isolated fatty acids in old rocks, including some more than a billion years old. In the late 1960s Abelson also elucidated some of the mechanisms involved in the conversion of biological materials into natural gas and pertroleum. An important step is incorporation of amino acids into humic acid and kerogen. Abelson

also contributed to the study of the origin of life. He pointed out in 1966 that most model experiments, such as that of S.L. Miller and H.C. Urey, employ assumptions not consonant with the realities of geochemistry. Abelson advanced evidence to support the hypothesis that the Earth's primitive atmosphere consisted largely of CO, N_2 and H_2. Solar irradiation of this mixture produced HCN, which polymerized in the primitive ocean, giving rise to amino acids. Abelson further pointed out that the nature of the environment limited the number of compounds available for life, which began in a thin rather than a thick soup.

In 1962, in addition to his work at the Carnegie Institution, Abelson accepted the editorship of Science, America's leading scientific weekly. In more than 300 editorials and scores of lectures, he treated many aspects of the interaction of science and public policy. He joined J.S. Huxley in the view that humankind now has the power to control its destiny. Abelson felt that at least some scientists should attempt to build bridges between science and society and that such efforts might be the most significant which responsible scientists could engage in during the foreseeable future.

Abelson entered what is now Washington State University in 1930 and received as B.S. in chemistry in 1933 and an M.S. in physics 2 years later. He then entered the University of California at Berkeley, working with Lawrence and the cyclotron in the Radiation Laboratory. After receiving the Ph.D. in physics in 1939, Abelson became associated with the department of terrestrial magnetism of the Carnegie Institution of Washington. Except for wartime work at the Naval Research laboratory, he remained with the institution, serving as its president from 1971 to 1978. For his wartime service Abelson was given in 1945 the Navy's highest civilian recognition, the Distinguished Civilian Service Medal. He also received the Modern Medicine Award (1967), Mellon Institute Award from Carnegie-Mellon University (1970), Joseph Priestley Award from Dickinson College (1973), Kalinga Prize from UNESCO (1973), and Scientific Achievement Award of the American Medical Association (1974). He was elected to the National Academy of Sciences in 1959.

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**UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION**

Acceptance Speach

by

Mr Philip H. Abelson,

**President, Carnegie Institution of Washington,
And Editor, Science**

**on the occasion of the presentation of the
Kalinga Prize
for the Popularization of Science**

Unesco House, Paris, 20 December 1973

I am most happy to be here in Unesco House to participate in ceremonies attending this award. When Mr. Patnaik established the Kalinga Prize in 1951 he demonstrated foresight and judgment. In his recognition of the need to increase public understanding of science, Mr. Patnaik was soon joined by others, including the American Association for the Advancement of Science. In that same year, this organization announced that one of its principal aims henceforth was "to increase public understanding and appreciation of the importance and promise of the methods of science in human progress." Since then, in every annual meeting of the Association and in the quarterly meetings of the board of directors, this topic has had a central place. Accordingly when the announcement was made of the Kalinga Prize for 1973, member of the Association and the board of directors joined me in being highly pleased with the news. I am greatful to all who have made this occasion possible.

With the passing yeas the necessity for better understanding of science by the public has increased. At this time, in the midst of an energy crisis, it is especially desirable that the public understand what it can and can not expect from science and technology. Because the energy crisis is of such central concern, I will make a few remarks about it.

The world has moved into a new era with respect to energy. The happy days of cheap, abundant petroleum are gone forever. Even before the Arab-Israeli War the oil producing and exporting countries had begun to increase prices. A few years ago the producing countries received about $ 14 per metric ton for their oil. Recently the Shah of Iran obtained $ 125 per ton for a large quantity of petroleum. Other producers are currently receiving smaller returns for their oil, but in each passing week there are additional announcements of major increases. The oil exporting countries are enjoying tremendous profits and political power. They will not meekly or quickly return to their status of early 1973. Sooner or later a new balance between demand and supply will be arrived at but at a cost for oil considerably above that of three months ago. What that price will lbe is indeterminate. Obviously, if demand is curtailed and if new sources of oil are developed the price will not be so great. Accordingly the oil consuming countries must reexamine their policies with respect to energy.

High on the agenda should be research and technology aimed at conservation. From observation in my own country I am satisfied that after some years the consumption of hydrocarbons there could be cut in half without substantial loss of comfort or efficiency. I am not talking about such measures as rationing or a ban on Sunday driving, but rather about use of smaller automobiles, better insulation of homes, and improved industrial processes.

Conservation efforts aimed at lessening the use of oil in some of the other consuming countries can not be expected to yield such a large saving as in the United States. However, a careful evaluation

would doubtless point to economies.

An obvious means for diminishing use of oil is to replace it by coal or nuclear energy in the generation of electric power. In some countries coal could also supplant oil as a source of energy for industry.

The current shortages will cause an intensification of exploration for new sources of oil and of development of better methods for extracting oil from known reservoirs. A brief description of some development in North America is illustrative of what can be done.

Adjacent to the United States on the continental shelves are substantial areas with geological features that usually are associated with large quantities of oil. Exploration of these potentialities will be expedited as a result of the current situation.

Present production methods result in the extraction of only a third of the oil known to be present in many reservoirs. Higher prices will justify expenditures needed to produce a larger fraction.

There are three potential sources of oil in North America, each of which exceeds the known reserves in the MiddleEast.

In northern Canada in Alberta are the Athabasca Tar Sands. These contain the equivalent of about 100,000,000 tons of oil. A successful commercial plant there has been in operation for about five yeas producing oil for less than $20 per ton. Another large plant has been authorized. In principle, production in Canada could be vastly expanded were the Canadians so minded. Indeed it would be possible for Canada to produce enough oil to meet all lof Europe's needs for a long time.

The other possibilities are less advanced. In western United States are shales containing vast quantities of oil. Engineering estimates indicate that the oil can be produced for about $25 a ton.

Nost of the regions of the United States contain substantial deposits of coal. The current situation is bringing about intensification of research aimed at obtaining hydrocarbon liquids by hydrogenation of coal.

President Nixon has called for energy independence by 1980. Until now the scientific and technological potential of the United States has not been mobilized. However, after the people of the country have experienced discomforts and shortages this winter they will demand action. Congress and the President will have no alternative but to mount major programs that could result in energy independenc considerably prior to 1980. Indeed, it would not be surprising if the United States were again to become an exporter of petroleum.

All of us are aware that total resources of oil and coal are limited. Nuclear energy, particularly that derived from breeder reactors, is of considerably greater potential magnitude. Even so that too is limited. Fusion research holds out the possibility of a vitually infinite source of energy, but the research may not succeed. The most prudent assumption is that mankind will have at its disposal finite sources of energy and that ultimately it must move towards use of renewable sources of energy and materials. The current crisis will tend to reinforce this view.

In the move toward an enduring economy, science will play a mojor role and there will continue to be a need for public understanding of science and of its consequences. Mr. Patnaik's vision in establishing the Kalinga Prize will continue to be justified for a long time.

Organic matter equivalent in quantity to the weight of the Earth has been created by living creatures since life originated on this planet.

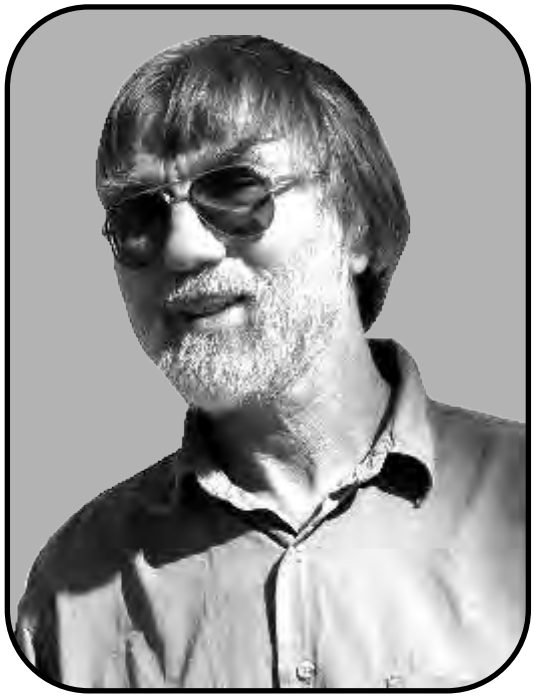
... Philip H. Abelson 1957

"Man is the Product of billions of years of hard-won evolution". We must notrisk permitting Zealots, however well-intentioned, to gamble with the future.

.... Philip H. Abelson, 1966

Kalinga Laureate for Popularization of Science – 1972

Mr. Nigel Calder, United Kingdom



[Born : 2nd December, 1931---]

Regarding Global Warning, Calder said :
"Governments are trying to achieve unanimity by stifling any Scientist who disagrees. Einstein could not have got funding under the present system."

Nigel Calder
A Brief Biographical Profile

[Science Writer with a Superb Record & Immense Experience)

Nigel Calder was born in London in 1931 and was educated at the Mercant Taylors' School and at Cambridge University, where he gained a master's degree in natural sciences. He served his apprenticeship as a science writer on the staff of New Scientist and from 1962 to 1966 was its editor-in-chief. Winner in 1972 of UNESCO's Kalinga Prize for the Popularization of Science, he has travelled around the world five times, seeking out the latest scientific knowledge and interpreting it for his readers. His other books include Violent Universe: An Eyewitness Account of the New Astronomy, The Restless Earth: A Report on the New Geology, The Weather Machine, The Key to the Universe, The Human Conspiracy: The New Science of Social Behaviour, The Life Game: Evolution and the New Biology, The Mind of Man: An Investigation into Current Research on the Brain and Human Nature, and Spaceships of the Mind. He has also contributed to both British and American publications, among the latter, Science, Science Year and Nation, and he wrote the script for the BBC television series Einstein's Universe.

Nigel Calder (born December 2, 1931) is British science writer.

Between 1956 and 1966, Calder wrote for the magazine New Scientist, serving, as editor from 1962 to 1966. Since that time, he has worked as an independent author and TV screenwriter. He has conceived and scripted thirteen major documentaries and series on popular science subjects broadcast by the BBC and Channel 4 (London), with accompanying books. **For his television work he received the Kalings Prize for the Popularization of Science in 1972.** In 2004, his book Magic Universe was short listed for The Aventis Prizes for Science Books.

Nigel Calder is the son of the late Lord Peter Ritchie Calder, a brother of the historian Angus Calder and the father of travel writer Simon Calder. His other children are Sarah (business writer), Penny (museums writer and consultant), Jo (working in an IT company) and Kate (public relations consultant). His wife Liz is his literary agent and was formerly an adviser on language teaching for the London Chambers of Commerce.

Regarding global warming, Calder said:

"Governments are trying to achieve unanimity by stifling any scientist who disagrees. Einstein could not have got funding under the present system."

He participated in the documentary film The Great Global Warming Swindle.

Works :

- **2007 The Chilling Stars-**joint author with Henrik Svensmark for Icon Books, etc.
- **2005 Albert Einstein : Relativity – introduction to a Penguin Classic,** Penguin USA
- **2005 Einstein's Universe (updated for Einstein Year)** – author, for Penguin UK & USA, etc.

- **2003** **Magic Universe: The Oxford Guide to Modern Science** – author, for Oxford UP, etc.
- **1999** **Success Story : 30 Discoveries** – compiler, for European Space Agency
- **1997** **The Manic Sun** – author, for Pilkington Press etc.
- **1995** **Beyond This World**-author, for European Space Agency
- **1994** **Comets : Speculations and Science-** reissue by Dover of The Comet is Coming!
- **1993** **Hubble Space Telescope : The Harvest So Far**-author, for European Space Agency
- **1992** **Giotto to the Comets**-author, for Presswork and Springer
- **1991** **Spaceship Earth** - author, for Viking UK etc.
- **1990** **Scientific Europe-** general editor, for Foundation Scientific Europe
- **1988** **Future Earth –** a contributing editor, for Croome Helm, etc.
- **1986** **The Green Machines** – author, for Putnam, etc.
- **1986** **The English Channel** – author, for Viking and Chatto
- **1983** **1984 and Beyond**-author, for Century and Viking
- **1983** **Timescale :** Atlas of the Fourth Dimension – author, for Viking etc.
- **1980** **The Comet is Comingl** – author, for BBC, Viking, etc. – reissued 1994
- **1979** **Nuclear Nightmares** – author, for BBC, Viking, etc.
- **1979** **Einstein's Universe** – author, for BBC, Viking, etc. – reissued 2005
- **1978** **Spaceships of the Mind** – author, for BBC, Viking, etc.
- **1977** **The Key to the Universe** – author, for BBC, Viking etc.
- **1976** **The Human Conspiracy** – author, for BBC, Viking, etc.
- **1974** **The Weather Machine** – author, for BBC, Viking, etc.
- **1973** **The Life Game** – author, for BBC, Viking, etc.
- 1**973** **Nature in the Round** – editor, for Weidenfeld
- **1972** **The Restless Earth** – author, for BBC, Viking, etc.
- **1970** **Living Tomorrow** – author, for Penguin Education
- **1970** **The Mind of Man** - author, for BBC, Viking, etc.
- **1969** **Technopolis** – author, of McGibbon & Kee, Shuster, etc.
- **1969** **The Violent Universe** – author, for BBC, Viking, etc.
- **1968** **Unless Peace Comes** – editor, for Allen Lane, Viking etc.
- **1967** **The Environment Game** – author, for Secker, Holt, etc.
- **1965** **The World in 1984** – editor, for Penguin etc.
- **1958** **Radio Astronomy** – author, for Phoenix
- **1957** **Robots** – author, for Phoenix
- **1957** **Electricity Grows Up**-author, for Phoenix

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- (2005) in Gullen, Zoe; Daniel Sefton: Debrett's People of Today. ISBN 1-870520-05-X

Source :

"http://en.wikipedia.org/wiki/Nigel_Calder"

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Meet the Guru of Sailing Systems Nigel Calder

By John Kettlewell

Nigel Calder is a well-known onboard-systems specialist, marine author and cruising family man. We visited him at his Maine home to find out how he balances his business with time for cruising

Nigel Calder got into motorcycles an sailing dinghies as a teenager, and has never been far from mechanical things an boats ever since. In a varied career, before becoming a full-time sailing writer he worked on automotive assembly lines, in foundries and machine shops, and on offshore oil production platforms. He and his wife, Terrie, have built a couple of 70-foot canal boats (on which they lived in England), and a 39-foot lngrid cutter. They then sailed a Pacific Seacraft 40 for 5 years. They have sailed in the North Sea, and extensively in the Caribbean, with Pippin (now aged 19) and Paul (17) augmenting the crew along the way. Nigel is best known for his Boatowner's Mechanical and Electrical Manual, and his Marine Diesel Engines, both in their second editions, and both considered the definitive works in their field. In addition to over 200 magazine articles, he has also authored a 'Cruising Guide to the Northwest Caribbean', 'Cuba: A Cruising Guide', 'Nigel Calder's Cruising Handbook: a Compendium for Coastal and Offshore Sailors' and 'How to Read a Nautical Chart'.

"Watch this!" Nigel Calder smiled and turned a battery switch. Almost instantly the room filled with choking smoke. As he disappeared in the acrid cloud, he expounded on the importance of proper onboard-circuit protection – having just demonstrated what happens when a dead short causes 400 amps to surge through an unfused wire.

The author of the best-selling Boatowner's Mechanical and Electrical Manual lives in a 200-year-old Maine farmhouse with attached barn when he isn't aboard Nada, the 38-foot, William Atkin-designed Ingrid cutter he and his wife, Terrie, built from a bare hull. For a man with Nigel's interests and avocation, that barn is a necessity. He's restoring an 18-foot wood Rhodes daysailer in one room, while a replica of boat's electrical system sits in another. In between are piles of rope, tools, cables, hoses, batteries, and endless bits and pieces needed by someone who can fix just about anything and, for a living, writes books about how to do it.

In addition to his electrical and mechanical endeavors, Nigel, in partnership with his wife, has found the time to take frequent, extended sailing trips and write two cruising guides to the northwest Caribbean. The Calders' two children, Paul and Pippin (aged 9 and 11), accompany them on their expeditions. Not surprisingly, Nigel describes himself as a "Type-A" personality, and his cruises tend to be research trips first, with adventure and education added bonuses.

Nigel was born and raised in England, where he began sailing dinghies on flooded gravel pits, though the English Channel was only an hour away. By the age of 13, he was rebuilding old motorcycles in the backyard. In college he salvaged cars from the "breaker" yard to use and sell to his friends. After college, he met his American wife-to-be, Terrie, and they were soon crossing the North Sea aboard a borrowed 28 – footer. After an inattentive freighter ran them down and nearly took the transom off the boat, Nigel started working at an automotive assembly line, and later in a foundry, to earn more money for repairs. Being a bit wary of the sea at this point, he and Terrie built two steel-hulled narrow boats for the English canal system. When they moved to Louisiana, his mechanical experience helped him to secure a job working on oil rigs in the Gulf Mexico.

Oil rig work was intense and dangerous – he survived three platform fires, was seriously burned, damaged his back, and nearly lost his legs. A deep respect for doing things the right way was implanted by these experiences, and today Nigel is a leader in promoting consistent marine quality standards. He recently tore out all the wiring in his boat to bring it up to American Boat and Yacht Council (ABYC) standards, because he felt he couldn't preach the gospel without living it himself.

His cruising guides show the same attention on detail as his mechanical books. For his Cuba guide, he used a portable electronic chart plotter (produced by KVH Industries) that gathers input from a GPS and depth sounder, then records everything on a PC. He can carry the whole rig in his 11-foot inflatable, allowing him to survey at 10 knots. Seeing this high-tech wizardry used by a cruiser flying the American flag prompted a Cuban gunboat to put the Calder family under"boat arrest" for nine days, until permission to proceed could be received from Havana. Despite this incident, Nigel loved Cuba and its people. He said, "They're unbelievably friendly. In six months we never heard a single hostile remark. They all differentiate between the American government and American people."

Nigel is a strong proponent of GPS navigation. He admits. "In probably four years, I haven't opened my sextant box even to see if it's still in there." But, he does log his GPS position every hour, and he stores a spare unit in the oven to protect if from lightning strikes. He couldn't create his guides without GPS. With Selective Availability turned on, GPS positions vary enough to affect the accuracy of the large-scale chartlets Nigel is creating-he's seen jumps of up to two miles at times, and he knows of several boats that have piled up on reefs. Surveys of the northwest Caribbean often date to the early 19th century, and chart inaccuracies are a bigger problem than GPS glitches, he warns.

The research needed to produce chartlets and a detailed guide for Cuba required an intense pace that was difficult for Terrie and the children. Added anxiety came from a badly damaged, variable –pitch prop, which gave them no reverse, a particular problem when entering uncharted reef passes. They careened Nada, but weren't able to make complete repairs without the correct parts. Typical days on the water were 12 to 16 hours long, shifting their home-schooling schedule to odd hours when everyone was tired. When they sailed from Louisiana (where Nada is kept) to Guatemala and back last winter, the memories of the difficult Cuban trip still lingered, and Nigel now says he'd separate his work from family cruising if both endeavors are to be successful. For future research voyages, he'll recruit non-family crew to help out.

The Calders believe successful cruising couples must be willing to work together to find a style of cruising that suits both partners. When he and Terrie first set off to sail around the world in their

newly finished boat, they found disappointment in the cramped quarters, bouts of seasickness, and struggles to raise two babies still in diapers. After 18 difficult months in the Caribbean, they concluded their plans would have to be modified before the cruise destroyed their marriage.

Terrie loved the travel, but not the sailing and the seasickness. Nigel wanted to sail, but found he could get his fill with shorter jaunts and the stimulus of writing. The schedule that evolved includes summers and some winters at their home base in Maine, with periodic cruises of up to six months aboard Nada. Shorter periods away from home allow the children to catch up in school while Nigel works full time from his home office,. "It's a compromise that works for us," he said. "it's difficult for the children to move in and out of the school system, Nigel says, "but the responsibility that goes with living on a boat is good for them."

Nigel loves describing the expeditions he and his family embark on every few years. Last winter's cruise to the northwest Caribbean covered 3,000 miles in there intense months, and was the first step in the arduous process toward updating his guide to the area. With Nada based near New Orleans, the longest passage was about 600 miles across the Gulf of Mexico-a trip the Calders have made 16 or 17 times. They leave with a norther blowing, so the first few days provide rough downwind sailing before the front withers and the currents and headwinds of the Yucatan Channel take over. The last bit is often a motor sailing slog into nasty seas built up by the strong current. Then they daysail and gunkhole, including a trip up Guatemala's Rio Dulce. Nigel's favorite cruising ground is the northwest Caribbean's Honduras, Guatemala, Belize and Mexico. "There's some great cruising", he says.

"Beautiful little islands, a wonderful reef. It's not very crowded. Culturally, it's really fascinating. The Mayan culture, both past and present, provides wonderful educational experiences for the children." He and Terrie discount the dangers of taking their family into remote areas. "For years the casualty rate in L.A. or Miami has been higher than in areas where they've got intermittent civil wars," says Nigel. "it's all a matter of perspective."

When it came time to christen their boat, Nigel and Terrie couldn't agree on a name, so they called her Nada ("nothing" in Spanish). The name is a great icebreaker when dealing with Spanish-speaking officials in the Caribbean, providing chuckles all around. Despite her name, Nada means a lot to the Calders. She has been a part-time home, a research vessel, and a vehicle with which the entire family can experience natural wonders and cultures few people get to contact first-hand. Nada is simple, rugged, comfortable, traditional, and safe. She suits Nigel's family and style of cruising. He states, "Every time you escalate the level of complexity, you escalate the long-term downtime for the boat, and the cost. You can get to the point where all you're doing is fixing the boat. We don't want to become slaves to the systems on the boat."

Nada's systems are fairly standards, with a few interesting twists. Nigel feels that electrics are the source of most problems on modern cruisers. Nada has a single, large battery bank, consisting of 8D marine gel batteies, with a smaller engine-starting battery isolated from the main bank. This arrangement reduces the daily draw on the batteries, as a percentage of the total capacity, from what it would be were there two banks. "The greater the depth of discharge, the shorter the battery life," Nigel explains. And, because the maximum charging rate is a percentage of the total battery capacity, higher rates can be used, reducing engine running time. Small solar panels keep the batteries charged when the boat's in storage, and a wind generator helps when at anchor. Nigel prefers gel betteries for the on-again off-again type of cruising he does, because they don't need to be monitored when the boat is in storage for prolonged periods.

Nada's details include reels at the bow and stern to store nylon anchor rodes, and to save Nigel's back, and a large electric windlass for all the all-chain main rode on the primary anchor. Nada was a very tender boat, so a recent conversion from ketch to cutter rig took over 1,000 pounds from aloft. Unfortunately, when Nigel moved the mainmast aft to rebalance the new sail plan, he moved it too far, increasing the weather helm. His next big project will be to move the mast several feet forward again. Other recent improvements include the installation of a new diesel and a three-bladed feathering propeller.

Nigel's recommendation to prospective cruisers is to find a tried-and-true boat from an established builder who has been in business a long time. Make sure the company not only has a good brand name, but a continuous track record producing cruising boats, he says. He believes even new boats should be surveyed, and buyers should plan on upgrading the electrical systems on most boats. He personally prefers equipment that has been on the market for a few years, to make sure all the bugs have been worked out. In his opinion, "It doesn't matter what these people plan on the drawing board; once it goes out to sea, they find out things nobody ever dreamed about."

Nigel thinks his degree in philosophy was good training for tacking mechanical and electrical problems. Philosophy is the application of logic to language, and he say, "Machines are entirely logical," A great believer in trial and error, he says, "You can't learn from books; you've got to do down there and try it as well, and you've got to break something. The book can tell you what steps to go through, but until you've actually done it, you haven't really learned anything."

Books by Nigel Calder :- Refrigeration for Pleasure Boats, International Marine 1990; Marine Diesel Engines, Second Edition, International Marine 1991; Boatowner's Mechanical and Electrical Manual, Second Edition, International Marine 1996; The Cruising Guide to the Northwest Caribbean, International Marine 1991; Cuba: A Crusing Guide, Imray Laurie Norie and Wilson Ltd. 1997.

Contact Nigel Calder on the Internet at : http://www.lincoln.midcoast.com/~ncalder.

John Kettlewell is a freelance boating writer, editor, and photographer. He and his wife, Leslie, have authored The Intracoastal Waterway Chartbook and The International Marine Light List And Waypoint Guide. A former editor for Reed's Nautical Almanacs of North America, Chart Kit, and International Marine publishing, John has cruised between Labrador and the Caribbean for more than 20 years, including 12 years of living aboard. His current boat is a 32-foot Marc Louis Rifflart catamaran. John and leslie are Rear Commodores in the Seven Seas Cruising Association.

Source :

From Cruising World, November 1997

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An Interview With Nigel Clader

A Prolific Author, BBC Commentator and Magazine Editor

Nigel Calder served his apprenticeship as a science writer on the original staff of the magazine New Scientist, and became its editor, 1962-66, Since then he has worked as an independent author and TV scriptwriter. He won the UNESCO Kalinga Prize for his work for the BBC in a long succession of 'science specials', with accompanying books. Examples are Violent Universe, Restless Earth and The Comet is Coming! The original version of Einstein's Universe accompanied a BBC-WGBH documentary with the same title, scripted by Calder and featuring leading scientists together with the actor Peter Ustinov. Calder continues to report from the frontiers of research, and his most recent book is a comprehensive guide to modern science, called Magic Universe (2003). It was short listed for the Aventis Prize for Science Books.

Nigel Calder, former editor of the New Scientist and author of innumerable books and articles on science, including The Chilling Stars, in conversation with Pan Pantziarka.

London Book Review (LBR) : Do you think there has been a change in the debate on climate change recently? Is there a greater willingness to entertain alternative views on the causes of climate change?

Nigel Calder (NC) : A local victory for free speech has occurred in the BBC, where an internal report on impartiality (June 2007) picked out climate change as a subject where dissenting voices really should be heard. That verdict is already having some effect, although BBC reporters still tend to assume that the Intergovernmental Panel on Climate Change must be right. More generally there's contrast between a hardening of attitudes on the part of the scientists, politicians and journalists in the 'man-made global warming' camp, which contrasts with more open skepticism among the general public. One reason for the latter may be horror fatigue, about all the scare stores. Another is a suspicion that politicians are glad of a new excuse to raise taxes. But most importantly there is plain common sense about the weather's variability. If you're told that a warm UK April 2007 is foretaste of hotter times to come, you cannot but ask what a cold and wet June Portends. And while some of the media and greenhouse scientists have fiercely attacked The Chilling Stars and Henrik Svensmark's theory, I've not heard a single complaint from friends, or friends of friends. It was the same when I appeared in the Channel 4 documentary 'The Great Global Warming Swindle'.

LBR : Given the controversy over 'The Great Global Warming Swindle?, do you think your decision to take part was a wise one?

NC : Yes I was in distinguished company with a string of prominent scientists to demonstrate that critics of the man-made warming hypothesis are not just a bunch of crackpots. There's been almost no attempt to rebut what we interviewees said individually and criticism were focused on some linking narrations and explanatory animations, which some of us might have scripted a bit differently. By the way, Al Gore's movie 'An Inconvenient Truth' is applauded by greenhouse scientists even though they know it contains misleading statements. To be inaccurate in a politically correct cause seems to be OK in their ethos.

LBR : Do you think that the idea of a scientific 'consensus' on climate change in now so firmly entrenched that it can't be shifted?

NC : The idea of a settled consensus is alien to productive science. In any branch of research that isn't moribund, battles rage between the entrenched bigwigs and their cronies, versus others who challenge their hypotheses. What

makes science so valuable for our species is that eventually errors are corrected and ideas shift. But that can be a slow and painful process taking 10-20 years. In the case of climate science, control of public research funding by the 'consensus' makes life difficult for the likes of Henrik Svensmark. Mother Nature may speed the change of heart if, as some of us half-expect, the next few years bring evidence of global cooling. Did you hear that on 9 July Buenos Aires had its first significant snowfall since 1918?

LBR : What kind of empirical evidence do you think would be needed to prove the theory that anthropogenic CO2 emissions cause global warming?

NC : It's likely that CO2 has some warming effect, but real proof of that hypothesis is tricky. You have to confirm by observation exactly how the CO2 changes the situation at different altitudes in the atmosphere and in different regions of the world. For example, CO2 is supposed to warm the upper air faster than the surface, but the measurements don't show that happening. When the CO2 effect is eventually pinned down, it will probably turn out to be weaker and much less worrisome than predicted by the global warming theorists.

LBR : How do you respond to the paper by Lockwood and Froehlich, which claims to comprehensively 'settle the debate' on the cosmic ray hypothesis you describe in the Chilling Stars?

NC : How often we've heard it before, that the debate has been settled! But this is an interesting case because these scientists accept that the Sun has played a big part in climate change over hundreds and thousands of years, just as we explain in the book. They even allow that it was involved in the warming in much of the 20th Century. And when Lockwood and Froehlich go on to say that the intensification of solar activity seen in the past hundred years has now ended, we don't disagree with that. We part company only when they say that temperatures have gone on shooting up, so that the recent rise can't have anything to do with the Sun, or with cosmic rays modulated by the Sun. In reality global temperatures have stopped rising. Data for both the surface and the lower air show no warming since 1999. That makes no sense by the hypothesis of global warming driven mainly by CO2, because the amount of CO2 in the air has gone on increasing. But the fact that the Sun is beginning to neglect its climatic duty-of batting away the cosmic rays that come from 'the chilling stars'-fits beautifully with this apparent end of global warming.

LBR : How can non-scientists make any sense of the competing theories being proposed, when even the observational evidence is being disputed?

NC : Forget the politics, if you can , and remember that, at the cutting edge of discovery, scientists are no more certain about what's really going on than men or women in the street. When a new finding is really surprising it falls outside the scope of existing curricula. There are neither textbooks nor highly trained people around, to be aloof in their specialist expertise. In such cases the discoverers sometimes short-circuit the academic process and take their discoveries to the general public as quickly and as directly as possible. Galileo, Darwin and Einstein all did that. They flattered their readers' intelligence as well as enlightening them, and let them make up their own minds about whether to believe the new stories. It's in that long tradition that Henrik Svensmark and I present in plain language Henrik's astonishing realization that our everyday clouds take their orders from the Sun and the stars. We're entirely happy that our readers, whether scientists or non-scientists, should weigh the arguments and form their own opinions, for or against us.

Source : London Book Review 2007
Published : July 16, 2007

Kalinga Laureate for Popularization of Science – 1974

Dr. José Reis, Brazil

[Born : 12th June, 1907, Rio de Janeiro , Brazil
Died : 16th May, 2002, São Paulo]

**“Science is beautiful and deeply aesthetic;
therefore we should exhibit it to Society”.**

...José Reis

José Reis
A Biographical Profile

A Noted Brazilian Scientist, Journalist, Scientific Leader and Science Writer.

Reis studied medicine at the University of Brazil's National Faculty of Medicine (presently Federal University of Rio de Janeiro from 1925 to 1930. After graduation, he started to work from 1928 to 1929 at the Instituto Oswaldo Cruz, having decided to specialize in scientific research in virology. For his scientific achievements there, he received the Oswaldo Cruz Medal. As a result, he accepted an invitation to move to São Paulo in the next year and work at the Instituto Biológico (Biological Institute), an applied research center set up by the state government, in the section of bacteriology. Later, he studied at the Rockefeller Institute in New York, USA, from 1935 to 1936.

Returning to Brazil, Dr. Reis resumed his work at the Biological Institute. Under the instigation of the Institute's director, the German biologist Hermann von lhering, to study a mysterious viral disease afflicting chicken producers in the state, he became gradually a renowned world expert on ornithopathology (avian diseases) and eventually was nominated director of the Institute. He felt also the urge to write pamphlets and booklets in a simple language, in order to instruct the agriculturists of the state on how to prevent and fight this and other diseases, and soon started to contribute regularly to a specialized magazine in this field, "Chácaras & Quintais".

In 1947, Dr.José Reis, who now displayed a marvelous talent for explaining scientific concepts for laypeople, started a parallel career as a journalist, first by writing a science column at one of the town's two most important newspapers, the Folha de São Paulo. He maintained this column for the next 55 years, until shortly before his death, probably a world record for a science newspaper columnist. The column was syndicated to many other newspapers. He also dabbed in general journalism, and became one of the editors-in-chief at the Folha from 1962 to 1968, during the critical years of the military régime which was installed in April 1964 in Brazil.

As a scientific leader, Dr. Reis was exceedingly important for the history of Brazilian science and technology, as one of the founders of the Brazilian Society for the Advancement of Science (SBPC), in 1949, together with other important scientific personalities of the country, such as Jorge Americano, Paulo Sawaya, Maurício Rocha e Silva, Gastão Rosenfeld, Wilson Teixeira Beraldo, José Ribeiro do Vale and others. He was also the founder and the editor-in-chief for almost his entire life of "Ciência e Cultura", SBPC's official journal.

Dr. Reis received many national and international prizes, awards and honours, such as the Jonh R. Reitermeyer Award, granted by the Interamerican Press Society and the Panamerican Press Union in 1964;and the prestigious Kalinga Prize for the Popularization of Science by UNESCO (United Nations Organization for Education, Science and Culture). In his honour, the Brazilian National Research Council (CNPq) instituted in 1978 the José Reis Award for the Divulgation of Science. His name is honoured also in the Núcleo José Reis de

Divulgação Científica, a research and education center at the School of Communication and Arts of the University of São Paulo.

He died of complications of multiple pneumonia in 2002, at 94 years of age.

Timeline :

1907 : On the 12th of June, in Rio de Janeiro, José Reis was born, the eleventh of thirteen children.

1920 : José Reis starts secondary school at Colégio D. Pedro II.

1924 : Finishes high school. José Reis wins the "Pantheon" prize, conferred on the best students of Colégio D. Pedro II.

1925 : Starts studies at the National School of Medicine (Faculdade Nacional de Medicina), in the basic discipline of microbiology. During his medicine course, he studies pathology at the Oswaldo Cruz Institute (Instituto Oswaldo Cruz) – an Applied Course – and obtains the gold medal of the Oswaldo Cruz Prize (which was not delivered due to lack of funds).

1929 : In that year's second semester, he was invited to work at the Biological Institute (Instituto Biológico). He was hired as a bacteriologist.

1930 : José Reis finishes medicine school.

1935/36: Professor Thomas M. invites him for an internship at the Rockefeller Institute, In the United States.

1936 : Publishes the book Tratado de Ornipatologia (Treatise of Ornithopathology – bird diseases), in collaboration with Paulo Nóbrega and Annita Swenson Reis.

1941 : J. Reis participates in the reorganization of the (Brazilian) Department of Agriculture; the book Rasgando Horizontes (Tearing Horizons), with C.B. Schmidt, resulted from this work.

1943 : Interventor (a temporary governor indicated by the President) Fernando Costa invites him to direct the Department of Public Service of the State of São Paulo (Departamento de Serviço Público do Estado de São Paulo).

1947 : April 6 : Begins to write for Folha da Manhã (Monrning Paper), Folha da Noite (Evening Paper) and Folha de São Paulo (São Paulo Paper) newspapers. In the beginning his writings concerned administrative matters, but later they regularly started to deal only with Science, continuing until he died in 2002, 55 years later.

1948 : July 8:J. Reis participates in the foundation of the Brazilan Society for the Progress of Science (Sociedade Brasileira para o progresso da Ciência) – SBPC "(…) under my initiative, for this purpose I gathered, initially, doctors Paulo Sawaya, Maurício Rocha e Silva and Gastão Rosenfeld, the Brazilian Society for the Progress of Science was founded, and I was its first secretary – general and which magazine Ciência e Cultura (Science and Culture) I currently direct, without compensation." Folha de S.Paulo starts his Sunday column The World of Science (No mundo da Ciência).

1949 : Founds and becomes editor of Ciência e Cultura (Science and Culture) magazine.

1950 : Becomes a professional journalist.

1954 : First phase as editor of SBPC's "Ciência e Cultura" magazine ends.

1955 : Becomes member of the Permanent Commission of the Integral Regime, until the advent of governor Adhemar de Barros's administration. Begins to collaborte with Anhembi (pronounced ain-am-bee) Magazine, with his column

"Ciêncial de 30 dias" (Sciece in the Past 30 Days).

1956 : Participates as relator on science teaching themes at the annual meeting of the Brazilian Education Association (Associação Brasileira de Educação), in Salvador, Bahia.

1957 : The second edition of his book Treatise of Ornithopathology is released.

1958 : Retires from the Biological Institute (Instituto Biológico), receiving the title of Emeritus Servant. Founds, with José Nabantino Ramos and Clóvis Queiroga, Editora IBRASA (IBRASA publishing house) – where he launches "ferment-books", which bring new ideas and bring about debate"; his performance as editor endures for 20 years, until 1978.

1962 : Assumes the post of Editing Director of Folha de São Paulo newspaper, "responsible for the orientation and writing of editorials, without compromising the science popularization work" (1962-67) Receives the Governor do Estado de SP (Governor of the State of São Paulo) Science Journalism Prize.

1963 : In a UN meeting about Science and Technology in Geneva, he presents a report on science attitude in teaching.

1964 : Awarded with the John R. Reitemeyer Prize in science journalism, conferred for the first time by the Interamerican Press Society (Sociedade Interamericana de Imprensa) and by the Panamerican Press Union (UniãoPanamericana de Imprensa).

1967 : Leaves the post of Editing Director at Folha de S. Paulo.

1968 : Publishes the book Educação é Investimento (Education is Investment), with preface by Alceu Amoroso Lima, from Editora IBRASA.

1972 : Returns to the position of diector of SBPC's Ciência e Cultura magazine.

1975 : Awarded with UNESCO' Kalinga Prize.

1978 : The José Reis Science Divulgation Prize is established by the National Council of Scientific and Technological Development, CNPq.

1986 : Ends his activities at Ciência e Cultura magazine, for which he was responsible from 1949 to 1954 and from 1972 to 1985.

1992 : The José Reis Center for the Popularization of Science (JRC) of the School of Communications and Arts at the University of São Paulo is founded.

1997 : A committee presided by Prof. Dr. Crodowaldo Pavan, comprised of members of the JRC, School of Communications and Arts, FAPESP and CNPq, celebrates on the 12th of June the ninetieth anniversary of José Reis.

1998 : On the 8th of July the first book of the Science Popularization Series, A Espiral em Busca do Infinito (The Spiral Toward Infinity) is released, honoring José Reis. It was created by the JRC team, under the supervision of Glória Kreinz and Crodowaldo Pavan.

1999 : José Reis continues to act as a journalist at Folha de S. Paulo, with his column Periscópio (Periscope), Idealistas Isolados (Isolated Idealists), the second book of the Science Popularization Series was publicated.

2000 : A text by José Reis, titled Fundação de Amparo à Pesquisa (Research Fostering Foundation), was published in the book Os Donos da Paisagem (The Landscape

Owners), third in the Science Popularization Series was publicated.

2001 : José Reis is elected honorary president of the recently founded Brazilian Association of Science Popularization, ABRADIC, and José Reis: Journalista, Cientista e Divulgador Cientifico (José Reis: Journalist, Cientist and Cientific Divugator), fourth in the Science Popularization Series was publicated.

2002 : Continued his work at Folha de S. Paulo until his death in May 16 and Ética e Divulgação Científica : Os Desafios do Novo Século (Ethic and Cientific Divulgation: The Challenges of the New Century), fifth in the Science Popularization Series was publicated.

After Death :

2003 : Divulgação Científica: Refexões (Cientific Divulgaiton : Refexions), sixth in the Science Popularization Series was publicated.

2004 : Congresso Internacional de Divulgação Científica (International Congress of Science Divulgation), seventh in the Science Popularization Series was publicated.

2005 : José Reis: Ciência, Poesia e Outros Caminhos (José Reis: Science, Poetry and Others), eighth in the Science Popularization Series was publicated.

2006 : Círculos Crescentes (Crescent Circles), ninth in the Science Popularizaiton Series was Publicated.

Quote :

"Science is beautiful and deeply esthetic; therefore we should exhibit it to society" (A ciência é bonita e profundamente estética; portanto, devemos exibi-la á sociedade)

External links :

- José Reis (http:// cienciahoje.uol.com.br/controlPanel/material/view/1243). Profiles in Science. "Ciência Hoje" magazine (in Portuguese).
- Núcleo José Reis de Divulgação Científica (http://www.eca.usp.br/nucleos/njr/)

Source :

http://en.wikipedia.org/wiki/JoseÃ©_Reis

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Jose Kings
The Passion for the Scientfic Spreading

The main characteristic of this great Popularizer of science in Brazil was the concern in writing science in the form that all the people understood. This deeply marked the career of this biomedical brilliant, journalist, educator and administrator.

His scientific life still started in the college: while he studied, he followed the course of application of the Oswaldo Institute Cross, to the end of which he gained the Oswaldo Prize Cross, but in time to the medal he received another type of rewards: an invitation to work in the Biological Institute of São Paulo as bacteriologist, this because he did not have mount of money for paying the prize to it.

The career of Popularizer of the science of the young started effectively there Jose Kings. In the first works already he felt necessity to divulge his research , that has practical effect in the life of the people. He started preparing pamphlets with accessible language and wrote scientific articles for the agricultural magazine Mansions and Yards.

In the life of Jose Kings, the figure of the Popularizer of science always was very much associated with the one of the educator. In his articles in the periodical Leaf of S. Paulo, or participating of lectures in all the country, or writing and publishing books, the biologist always demonstrated concern in teaching.

His intense career as researcher did not hinder that he kept a shining career as journalist- which took him to the position of Writing director of the Leaf of S. Paulo for many years, keeping until the end of his days, the famous column “Periscope” where he wrote in all the Sundays, in the supplement More, since 1999 until his death.

Jose Kings wrote on everything: the launching of the most modern space satellite or the extinguishing of the dinossauros was subjects for his column. He also had a great concern for the children. This is not one of his activities very known, but he wrote books for the infantoyouthful public to stimulate in the children the interest and discipline them scientific.

Jose kings was incentivador of projects as the “Money market of Science” (promoted for the Hoescht company and the Foundation Marine Robert) and the “Station Science” (National Advice of Scientific and Technological Development (CNPq). He idealized diverse competitions for youth, but his paper was basic in the prize “Scientists of tomorrow”, created for the Organization of the Nations Joined for the Education, Science and the Culture (UNESCO) and for the Brazilian Institute of Education, Science and Culture (Ibecc).

It was Proper that a Prize was introduced on his name. Since 1978, the CNPq grants, annually, the “Prize Jose Kings of Scientific Spreading” the institutions, journalists and scientists. Moreover, Jose Kings participated in the foundation of the Brazilian Society for the Progress of Ciência (SBPC) in 1948, being the first secretary-generality of the entity. Throughout his 94 years of life, innumerable had been the prizes that he received for his contribution to Brazilian science.

When asked on the origin of his passion for teaching science, in special, in so simple and pleasant form, he answered: “ I tried to teach to the others what of they outrem I could not learn”.

Jose Kings was Carioca, and was born in 12 of June of 1907. He died in day 16 of May of 2002.

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Jose Kings
THE "KING" OF THE SCIENTIFIC SPREADING

Name of scientific prize, Jose Kings is the protector of all the scientific journalists of Brazil and also of that they believe that this still can help to change some thing.

Tenth first son of a composed family for thirteen brothers, since small already was distinguished. He taught to the employees of his house to read and to write. His notebooks of school did not contain only substances given for the professors, but commentaries that the boy made – many contrary times to that he was taught -, and a supplemental content searched and discovered by him.

Been born in 12 of June of 1907, Rio De Janeiro, the boy did not remain itself in the anonymity. To the 17 years, after the conclusion of his secondary course, he got its first prize, "Pantheon", only conferred to the best pupils of the Dom college Peter II.

He did not delay that young man very to enter the National College of Medicine, Rio De Janeiro, the basic chair of Microbiology. Parallel to the course of Medicine he carried through the course of application in Pathology, in the Osvaldo Institute Cross, where it got, with merit, the gold medal of the Osvaldo prize Cross that, however, it was not delivered due to shortage of money.

Since then the invitations for work alone had increased. In 1930, he concluded the course of Medicine and was invited by the professor Thomas M. Rivers, to serve as apprentice in the Rockfeller Institute, the United States. Six years later, in return to Brazil, he published his first book, Treat to Ornitopatologia, in contribution with Pablo Nóbrega and Annita Swenson Kings.

His promising career of Populariser of Science had only started. Contracted to work in the Biological Institute of São Paulo as bactericista, the young biologist started to search on a plague that devastated the hens of the region. Anxious for sharing his discoveries with the society he felt the necessity to divulge its curious results, in order to help to decide the life of the people.

It was then that, by means of an easy and accessible language, in which the scientific content was adapted to the popular way, that Kings stated to prepare pamphlets and to write articles for agricultural magazine Mansions and Yards. These had been pioneering articles in the branch of the scientific journalism.

In 6 of April of 1947, after to participate of some positions of the public service of São Paulo, Jose Kings linitiates his work of Populariser in the Leaf of the Morning – responsible for the Leaf of the Night and Leaf of S.Paulo. Initially, he wrote on administrative subjects, but after that, started to divulge subjects concerning science, becoming the publisher of Science of the periodical. In 8 of June of the same year, the scientist participated massive of the foundation of the Brazilian Society for the Progress of Science, and created Science and Culture, magazine of scientific spreading supported by the entity.

Three years later, with his professional register of journalist, Kings if he became writing director of the *Leaf of S.Paulo.* Since then, his career shot up. He participated in the north & the south lectures, wrote and he published books, he stimulated fairs of sciences and prizes for the children, beyond his untiring fights for the institution of the foundations of support to the research, as the Brazilian Association of Divulgação Científica (ABRADIC), where he was honorary president.

The biologist and scientist conquered some prizes as the Kalinga Prize for scientific spreading; Science and Culture, of the government of the State of São Paulo de Scientific Jornalismo and the prize John. R.Reitemeyer de Scientific Jornalismo, conferred for the first time for the Inter-American Society of the Press and the Union Panamericana de Imprensa.

Jose Kings never rested. He acted as journalist in the periodical Leaf of S.Paulo, the column "Periscope" until his death, in 16 of May of 2002. Of the life of Jose Kings it is possible to extract the simplicity of a man who lived the fore front of his time. For the journalist, doctor, researcher and the most important educator "are not to know very, but to know well". In the interview in the magazine Science Today, in 1982 it affirmed that "the reader identifies in (mine) writings the only virtue that they really have, the sincerity".

Tiago Cabreira

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Prof. Dr. Jose Kings
Father of the Scientific Spreading in Brazil

Prof. Dr. Jose Kings, doctor, scientist, educator and journalist, entered the Biological Institute, in 1929, retiring in 1958.The research in the field of the microbiology was dedicated to him and, for influence of Rodolfo von Ihering, he started to study the illnesses that acometiam the birds. Jose Kings expressed in an interview for the magazine "the Biological one" in 1995 – "to try to decide the question of the illnesses that the poultry keepers presented as difficulties in the creation of the birds". "More humble Men of the field and his impressive necessity to learn".

In the Section of Ornitopatologia he developed his activities of research.

"an institution of research of animal pathology Never studied in such a way on illnesses of the birds and a so great volume of information on poultry keeping had never been systemize, as it are made for three researchers, Jose Kings, Anita Swensson Reis and Pablo of the C. Nóbrega" said Dr. Enrique of the managing Rock Rasp of the Biological Institute at that time.

The term **ornitopatologia** was created by Jose Kings, used the ornitoiatria term. He justified the creation of this term for it to study the illnesses of the birds in global way, since the etiology until the patogenia and the pathological anatomy, to conclude, indicating the measures of therapeutical prevention and, and not as a clinical subject. In this subject he prepared for the innumerable poultry keepers brochures in accessible language to the producers. He later organized these brochures in an only book that received excellent opinions from the readers interested in the subject. Each time was magined more the Prof. Jose Kings, as a true popularizer of the knowledge. Thanks to his efforts of assistance and education techniques, the Biological Institute started to center and to co-ordinate all the action of the creators of birds of the State of São Paulo.

This eminent researcher liked the things that produced something for the producers better. He executed the true chain of knowledge, took care of the demand, he studied the illness, he searched the best way to detect it, applied his knowledge, he unmasked for the community the mystery of the illness and used all this gamma that permeava its way of being, innovating the spreading of the research that he was then, content only for some. This spreading never left of being the research properly said, therefore it went to the meeting of the yearnings of the producers that had, in the Biological Institute, the way for the solution of its problems.

For some years, when filing his notations of day-by-day, its colloquies with the poultry keepers, his lectures for the cooperated associates of the most diverse cooperatives, also of neighboring countries, his scientific fiches of autopsies, works, at last his more complete archives, propitiated, together with the Dr. Pablo of the Wedge Nóbrega and with the contribution of the Drs. Annita S. Reis, Raphael de Castro Bueno and M. Giovannoni, the inigualável "Treat to illnesses of the Birds". He writes down Jose Kings- "to obtain a more or less efficient work in relation to the illnesses of birds, I had to pass one 6 years without thinking noutra thing, bogged in hen until the ears…". The Prof. Rock Rasp, director of the Biological Institute, says, in the presentation of the book cited above, "workmanship with the treated character of one on the deep subject and long studied and investigated practically for its authors until having acquired scientific authority necessary to guarantee the

excellency of one such source of teachings".

As part of his knowledge always he cited the meetings of the Fridays, sextaferinas, as they called to the time, always having in the command Enrique of the Rock Rasp, that stimulated his technician to participate of these meetings where researchers of some institutions argued science. Result of this, Pablo Sawaya, Maurício Rock and Hisses, Jose Reis and Gastão Rosenfeld, participating in these memorable meeting, had created the SBPC.

One of his bigger abilities was to write, the activity to change in small the scientific information for the great public. Certain time, Jose Kings cites in an interview "Prof. Otto Bier asked to me if he was not monotonous and tiring all week to arrange a different subject and to prepare it for spreading. I believe to have shown that thus it does not occur because this task involves two of the biggest pleasures of this life: to learn and to distribute".

Dr. Jose Kings received some prizes as the Prize "John R. Reitemeyer", in Mexico; **the Prize "Kalinga" received in the headquarters from the CNPq;** Prize "Biological Institue" in the proper IB. Has name given in his homage in Audience in the Biological Institute. In his homage also the "Nucleus was created Jose Kings of Scientific Spreading", in the ECA/USP, that is commanded by the eminent researcher Prof. Crodowaldo Pavan, having as its collaborators the great admirers of the Prof. Jose Kings, the Prof. Glory Kreinz and Ormir J. Nunes. Still in 2001, in day 12 of June, when Jose Kings completed 94 years, it was established for initiative of the group of the Nucleus, the Brazilian Association of Cientifica-ABRADIC Spreading, to pay homage to him. Also, the CNPq and the FAPESP had homaged him with prizes in his name.

Besides writing workmanships of scientific spreading for periodicals, brochures directed to the creators, infanto-youthful books, carrying through lectures, to monitor visits the laboratories, assumed the direction of the writing of the Leaf of São Paulo, the invitation of Otávio Cold, finding a penosa task at transistion moment and, for the periodical, of economic crisis, everything this aggravated by the advent of the 1964 revolution. The marginalização of the students and the storm that if abated on the USP and other universities, where some professors denounced colleagues, all brilliants, that in the majority had finished with its truncated careers, although acquitted in the inquiries policeman – military against opened them, they had mobilized the periodical under the publishing direction of Jose Kings. He became Leaf the guard of the university ideals. He published in the Leaf up to one day before falecer in the column "Periscope", work of much research, in which looked for to give glance of the main world-wide scientific experiences. "This activity is continuation of work that comes making has 50 years and still it gives much satisfaction to me".

Always intent to the medias the education concept travelled all for the State of São Paulo, fighting as well-of-I consume, what it seemed to want to prevail, and, still, involved professors and pupils of the courses primary and secondary in the organization of science fairs. It was in this way that if made "traveling teller" of science.

The fairs of science, clubs of science and competitions "Scientists of" had tomorrow been born of pregação in the Leaf, allied to the work of orientation and accomplishment of the Brazilian Institute of Education, Science and Culture, agency of UNESCO.

Also, in the Calendar of São Paulo, he included a section of science, which if it charged the Profa. Maria Julieta Ormastroni. He directed the magazine "Science and Culture" of the SBPC, collaborated in the Anhembi magazine, destined to the more homogeneous public one of the one than of the Leaf.

Prof. Dr. Jose Kings at least did not leave one day to make science, his scientific works, the creation of the science fairs, his lectures, his participation in

the context of the society will be perpetual for the always current landmark that left for all we.

Some phrases of the Prof. Jose Kings who say very of itself.

“the Communication is one of the great forces inside of the scientific institutions…”

“I assume that the joy of the divulgador is greater that of the master, who teaches in formal classrooms. The divulgador exerts a teaching without classroom.”

“It could be said that it has an aesthetic component in the act of the documentation that, after all, fixes what in it enchants them”.

“I recognize today that never it contented me practical pure and the simple ones of a specialty. I always looked for to complete it with its history and, if not it philosophy, filosofar on the essence of the carried through work, its significação, its position in the context of knowing”.

“This work to go espontaneamente to the creators, in its farms and its proper environment, to take knowledge of its problems an to study and to suggest solutions for they, is necessarily most important of all, the key master of all the campaign of agricultural education of which will result the survey of the level of our workers of the field”.

“One of its greaters youreward:to learn, trying to teach”.

***Collection Jose Kings* – Archive Biological Institute**

Writing for : Márcia Rebouças

Kalinga Laureate for Popularization of Science – 1974

Dr. Luis Estrada Martinez, Mexico

[Born : June 1932, Mexico ...]

I believe that it is possible to distinguish science from the technology.

I believe in that science is a comunicable knowledge, that must be elaborated with spirit of participation and in benefit of all.

I believe in that the spreading of science is an average one for the formation of the person.

LUIS ESTRADA MARTINEZ

- I am still being a professor of the National University of Mexico and in my labor my main concern is the recognition of the communication of science as an academic category.
- I am leading a little group working in the public understanding of science whose more visible product in this moment is the maintenance of the web site "cienciorama"
- I am engaged, with academic support of the Seminario de Cultura Mexicana (Seminar of Mexican Culture) of which I am a Titular Member, in the promotion of science as a part of the human culture.

"Luis Estrada"
<lestrada@servidor.unam.mx>

Concerned about the gulf of ignorance separating the tiny minority with some scientific training from the vast majority having little or no knowledge of science, Luis Estrada, a professor at the National Autonomous University of Mexico (known by its Spanish initials as UNAM), established in 1968 *Fisica,* a periodical dedicated to the systematic vulgarization of science. After two difficult years, *Fisica* attracted support from UNAM and the National Council for Science and Technology and was able to broaden its scope, reflected in its current title, *Naturaleza.*

In 1970, UNAM's directorate-general for cultural propagation established a science department, and Estrada was appointed to head it. In addition to the usual conferences and exhibitions, Estrada introduced "coffee house chats" and "talks" to bring together scientists and laymen, including many students, to discuss particular issues and not only from the scientific point of view. Some of these discussions have been animated by audio-visual presentations, including puppet theatre and circus acts. He has also promoted science clubs and fairs.

Estrada obtained his Ph.D. in physics from UNAM in 1956 an taught physics there, except during brief assignments with other universities. He had specialized training at the Massachusetts Institute of Technology (Cambridge, USA) from 1958 to 1960, and he was appointed "assessor" at the National Institute of Nuclear Energy, Mexico, in 1962.

Born in Mexico in June 1932, Luis Estrada is the youngest Kalinga Prize Laureate during the Prize's first 25 years. He was awarded the Prize in 1974 *exaequo* with Jose Reis.

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"THE SPREADING OF SCIENCE IN A UNIVERSITY"

Dr Luis Estrada Martinez
Center of Applied Sciences and Technological Development

In the round tables he is frequent to hear the complaint of the last one in taking part consisting of which their preceding ones already said everything. With base in this experience I have requested to be the last one in speaking hoping that everything is this. In effect, in this table and other sites and occasions, everything has been said and as also everything follows equal, I suspect that we are understanding in different forms the words that we repeated. Therefore, with the pretension to contribute something to this table, I will try to repeat much of already this.

I will begin to reiterate that the spreading of science is a tendiente work to make available of a general public the scientific knowledge. I will also repeat that this knowledge is characterized by the followed procedure to obtain it and that in many occasions this way teachers to us more than the obtained results. For that reason the publishing ones of science insist on showing, like essential part of their work, the procedures followed in the scientific research. Finally I will say that, apparently, already all we accepted that science is a part of the culture.

With the saying I feel forced to make some explanations. I am using the concept of scientific knowledge like a synonymous one of science? Hablo of investigation procedures to elude the idea of scientific method? What is science and what is culture? Although already I showed my feeling of obligation I will not try to respond those questions nor to follow my list of repetitions, because the saying is sufficient to channel the isolated and disconnected reflections that I have decided to expose here.

First, Desire to share a knowledge can be made in many forms and places. In our means he is usual to associate the knowledge acquisition with the schools, although one begins to accept other forms to obtain it. Nevertheless science continues being thing of the school and what it is taken care of more it is that its presentation is made in agreement with the scholastic level.

In the diffusion of science other forms have taken terrain, like the museums, but most of those other forms they follow inserted in our country in the average student. We do not forget that here we are reunited by the interest of a university renovation. What I want to make clear is that we are considering here activities of spreading of science supported, prepared and presented/displayed by a university.

Second. The common thing is to justify the work of spreading of science with arguments to support the development of the scientific research. Thus one begins to affirm that science is an essential factor of the development of the countries and that in our country still very is reduced, that science is an economic value and that the industrialists are not conscious of it and she is wanted to resort, with these and other similar arguments, to the spreading of science to remedy such deficiencies. It is repeated that there is to promote scientific vocations in the young people and who there are to be on the awares to the industrialists and whom that stops the spreading of science is a powerful aid.

Third. Recently two qualities have spread more: science is amused and its spreading is healthy entertainment. It seems that there is to vindicate to science being erased memories caused by the boredom that some we felt when we had to attend

some classes of science, specially those of physics. Also it is necessary to already take advantage of the remarkable interest our great public by presented/displayed subjects of science in massive means of communication like the obtained one in the television by some chapters of the Discovery Channel, that call plus the attention that always present others in the common programmings of our gratuitous television stations.

It is not either necessary to forget that the increasing population of our city requires of more and better spaces of relaxation and diversion and that our university always has contributed to the ample and good distribution of the culture.

Fourth. Varied the greater attention to the necessity of and more currículos is something that does not have to be left to a side. Although many complain which the formation and "cultural" experience is something that counts very little in currículo, the addition of these merits is every greater time. Without considering that some assure that this phenomenon is only part of a necessary growth as large as currículo, lately they have appeared signs very clear of desire to participate seriously in that class of activities and to acquire a good formation to carry out them.

The increase of supplies and opportunities, like graduated and masters, in the field of the spreading of science are a good example. Very related to this subject it is the restlessness that many describe like the "profesionalización" of the spreading of science, since this one gives to the interest by that activity another university quality.

I will not add to more subjects of reflection because desire to make specific my participation in this table. I want before to leave based that what is repeated "by something repeats" and that the subjects that I mentioned not only are pertient, reason why it is not necessary to scorn them, but that they have influenced more than what commonly it is recognized in the development of the activities of spreading of science in our University. Nevertheless, I insist on external the opinions that I try to give.

Science is a knowledge and as so it is educative matter. By east nature knowledge is not static and the present scientific research not only increases it but also it corrects it, it needs and it deepens. Still more, in the recent times the tendency to the confrontation of specialized knowledge and the interdisciplinary collaboration has increased in very remarkable form. I repeat again that the scientific knowledge is derived from a procedure that is to him own, that is communicable and that can be taught at least with the example and the work in equipment.

A university is, fundamentally, an educative center and the scientific knowledge is, now more than ever, an essential knowledge. I must emphasize that a specialized, increasing knowledge and in permanent evolution, like science, it requires for his accomplishment of a space and an atmosphere that in our means only can give, so far, our University. I must also stress that the calls "sustantivas functions" of our house of studies-teaching, investigation and diffusion of the culture are all necessary for the case of science. Nevertheless, I must also indicate it, the exercise of them in the subject that concerns to us does not have to be made mechanically and only "fulfill". Of equal way I must mention at least that that division of university functions, as now is practically applied, is, in the case of science, artificial and anachronistic, reason why he is urgent to review it and to update it.

The revision and update of the university functions are a responsibility of our University that never has been denied, although only weakly exerted. It is possible to emphasize that it is an academic work that must be developed with tranquility and spirit of approach, understanding, collaboration and search of consensuses.

It is a task of educated people-it entiéndase: people with a good university formation that they have accepted to educate the new generations and who have shown to know how to exert well their commitment and to apply it with wisdom. I do not create to deceive me when thinking that our University has very many of those people and who they only hope the opportunity to act. I hope and I trust that this one is a good moment to excite them to build. And as for the spreading of science in our university, permítan me no longer to repeat more.

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QUOTES OF
Prof. LUIS ESTRADA

- I believe in that science is a comunicable knowledge, that must be elaborated with spirit of participation and in benefit of all.
- Science is as useful as to know how to read and to write and as useless as it could be the beauty.
- Science is a part of the culture of any town although to this one it has been classified to him like "of tradition humanist".
- **I believe in that it is possible to maintain favorable means to science and to lay the foundations a tradition that includes it in explicit form.**
- Science is a human activity in that also appears doubts, prejudices, illusions, anguishes and hopes.
- To know of the scientific world is part of our right to the information; that this knowledge is not deformed is a responsibility of the scientists.
- **I believe in that the spreading of science is an average one for the formation of the person.**
- The spreading of science helps to really develop a "criterion" that will allow to distinguish the true thing of the false thing and it signs it of the doubtful thing.
- The spreading of science favors the confrontation of the diverse points of view, allows to the exercise of the critic and aid to the understanding of the different positions.
- The spreading of science helps to become aware greater from our place in the world, specially when clarifying our interdependence.
- **I believe that it is possible to distinguish to the science of the technology.**
- To reduce the scientific knowledge to useful formulas to create new products and devices is to deny all importance to him.
- The scientific knowledge can help us to live better in a civilization conformed by the technology and programmed on hidden way.
- **I believe in the spreading of science like a work of permanent education, that helps to renew the knowledge of the profesionistas and complements the scholastic activities.**
- The spreading of science makes participate us in a experience of continuous renovation sustained by people it jeopardize in the revision and the extension of its knowledge.
- The spreading of science helps to distinguish the excellent thing of the irrelevant thing and it teaches to us to raise alternatives for the solution of problems.

- **I believe in that everything is not science and in which are more things in the sky and in the Earth of which it dreams our philosophy.**
- It will be necessary to look for everywhere the sense of the life and to decide in what sense we wished to progress.
- Nevertheless, our future also depends on science and will have to be constructed with the effort and agreement of all.

Therefore, I invite our readers to reflect about the spreading of science and to unite efforts so that this work fructifies in our country.

Article published in Nature (vol.13 Num. 6, p 273-274, December 1982)

Luis Estrada *is one of the pillars of the spreading of Science in Mexico. At the moment he directs the Seminary of Mexican Culture, is member of the Center of Applied Sciences and Technological Development of the UNAM and coordinates the project Subjects of Contemporary Science.*

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Luis Estrade Martinez
The Pioneer of the Popularization of Science in Mexico

Luis Estrada came to physics by chance. “In my childhood I did not know what was to be physical or understand what it was physics, although very young I had a tendency toward scientific knowledge.” Neither imagined then that would devote their efforts to spread from science the wonders of the matter, nature, culture and the cosmos, to become a leading figure of science communication at the UNAM in Mexico and Latin America.

About your vocation adds: “As a city kid, I drew all the technological artifacts. I particularly wanted to know how the electrical equipment, especially radios. For me it was a mystery electricity.” Luis Estrada was born in Mexico City in 1932 and spent a happy childhood. He was the eldest of five siblings, his parents created an atmosphere of good living at home and led their children’s interest in the study. His father caught the taste of music, but he warned that “did not live it,” says Luis Estrada. “As a kid I tried to sing and play guitar, but I was not given,” he says nostalgically.

Dr. Estrada opens the doors of your home and your concerns. Expose your concepts and desires, remembers his childhood, his travels? shines through every moment and its great human warmth. “I relate to easily, but deep down I’m retiring. I enjoy the solitude. I consider myself very critical and I am increasingly worse. For me there are three important things: first, freedom and independence and the other, experience I get from dealing with others. This has allowed me to know, understand, evaluate and refine many things. “ thesis and then worked with other partners in many of its ideas and projects. I said he was a tank because nothing stopped him in his intentions. He helped his students in an impressive manner. He was generous and had great patience and hope that we put our minds to scientific research. I also remember a lot Alejandro Medina, chemical origin, but with great physical training. It was multifaceted: he played the piano and organ and infects us his love of music.” Luis Estrada then adds: “My generation was characterized by a thirst for knowledge. We spent all day studying and we got into issues that went beyond the academic program of courses.”

After doing his thesis, he joined the Physics Institute of the UNAM as an assistant to his teacher and the idea of engaging in nuclear physics. He received a doctorate in the Faculty of Sciences and in 1958, after presenting his overview of knowledge, was at the Massachusetts Institute of Technology, a grant from the National Nuclear Energy Commission and the UNAM. There he had as a tutor Professor Herman Feshbach. “The most valuable thing I learned in these adventures was the importance of mathematics in the development of theoretical physics. Then awoke in me a great desire to be a teacher and I had met there.”

As a professor of theoretical physics at the Faculty of Science, “where he has taught for five decades,” tested innovative ways to learn physics, organizes seminars to meet and discuss current issues for science and other ways to complement and enhance conventional curricula. This concern led him down a path unexplored. In this regard says: “The popularization of science as is now done in those days was unknown and the closest to it were the lectures for the general public, who were part of some conferences and meetings of scientific societies. This encouraged me more to explore this area and began to organize physics lectures to spread to a wider audience. “

In 1967 elected him editor of the Bulletin of the Mexican Physics Society (SMF). With the help of colleagues from the Institute of Physics and the Faculty of Sciences, proposed changes culminate

in the founding of the journal Physics. This publication is established independently and then separated from the SMF. In 1970, became Nature Physics, the creation of the Science Department at the Directorate General of Cultural de la UNAM. The foundation of this department is a milestone in the history of science communication at the UNAM. Since then, Nature was the standard of the work. However, he had to stop running 15 years later.

To develop this academic Luis Estrada brought together many volunteers and helped in the formation of others. The brand new disseminators organized his work as a workshop. From the experience of editing Nature, Science Department activities were expanding. Were conducted conferences, exhibitions, workshops and other activities to bring science to the public. Thus arose an agreement with the Ministry of Education to establish the Experimental Program for the Popularization of Science, which later culminated in the founding in 1980, the University Center for Science Communication (CUCC). Luis Estrada was CUCC director from 1980 to 1989 and in 1990 was among the founders of the Mexican Society for Popularization of Science and Technology (SOMEDICYT).

Today Luis Estrada is researcher at the Center for Applied Sciences and Technological Development (CCADET) of the UNAM, but participates in the activities of the Directorate General for Dissemination of Science, thanks to a collaboration agreement between the two universities. Its main task is to guide the project "Contemporary Science Topics" (TCC), which aims to provide an overview of knowledge investigadel world we live in, for which it is leveraging the vast amount of information from scientific research and the effectiveness electronic means of communication. The TCC project covers three areas: the site "Cienciorama" (www.cienciorama.Unam.mx). seminars to discuss the progress of scientific research, workshops and other activities to prepare material for dissemination of science and to assist in the formation of new disclosures.

Luis Estrada likes to look for relationships between the various achievements of modern science, especially those relating to the nature of matter and existence of life on Earth. She loves the study of the deep sense of science literacy, as well as the relationship between science and the rest of culture. Some of his thoughts on the release were published by the DGDC in the book entitled Disclosure of science: education or ministry? Their conclusions about the second issue will appear in Science and Culture, also published by the DGDC.

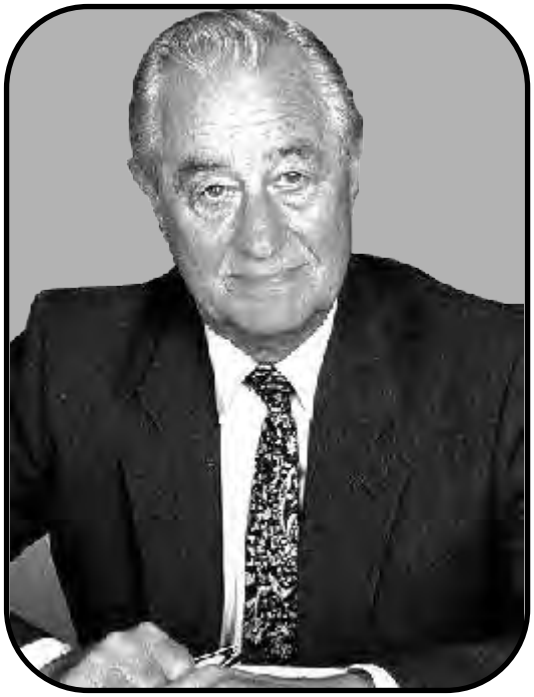
One child fascinated by technological artifacts, the young surprised by the rapid development of nuclear physics, the master builder of scientific and tireless popularizer is recognized today in Mexico and internationally as the pioneer of the popularization of science in our country. It was the first Mexican to whom the UNESCO Kalinga Prize awarded in 1974. Last April, the Mexican Academy of Sciences and the SOMEDICYT a tribute dedicated to him.

Personally

Vision of the Future :
I am a bit pessimistic, I think we quickly made human extinction, mainly due to overpopulation and environmental degradation.
Music :
I listen to everything, especially the so-called classical, jazz and folk.
Literature :
I like novels and I have a penchant for drama.
Travel favorites:
A traditional cities of Mexico and lonely places, especially near the sea.

Kalinga Laureate for Popularization of Science – 1976

Sir George Porter, United Kingdom
Nobel Laureate in Chemistry – 1967



[Born : 6th December ,1920, Stainforth, Yorkshire, England
Died : 31st August , 2002, Canterbury , Kent, England]

The Search for knowledge is the highest aim of Mankind.

....Lord Porter

Science is, on the whole, an informal activity, a life of shirt sleeves and coffee served in beakers.

...Lord Porter

George Porter – Biography

(b. Dec. 6, 1920, Stainforth, Yorkshire, Eng.), English chemist, corecipient with fellow Englishman Ronald George Wreyford Norrish and Manfred Eigen of West Germany of the 1967 Nobel Prize for Chemistry. All three were honoured for their studies in flash photolysis, a technique for observing the intermediate stages of very fast chemical reactions.

After undergraduate work at the University of Leeds, Porter earned his doctorate at the University of Cambridge under Norrish in 1949. He continued on there, developing the technique of flash photolysis with Norrish. In this technique, a gas or liquid in equilibrium is illuminated with an ultra-short burst of light that causes photochemical reactions in the substance. The extremely short-lived intermediate products of these reactions are illuminated by a second burst of light that enables an absorption spectrum to be taken of the reaction products before the gas has returned to a state of equilibrium. Porter specifically studied the equilibrium of chlorine atoms and molecules. In 1955 he joined the faculty of chemistry at the University of Sheffield, where he taught until 1966, becoming in that year director of the Royal Institution of Great Britain and Fullerian professor of chemistry. Porter was knighted in 1972.

George Porter was born in the West Riding of Yorkshire on the 6th December 1920. He married Stella Jean Brooke on the 25th August 1949 and they have two sons, John and Andrew.

His first education was at local primary and grammar schools and in 1938 he went, as Ackroyd Scholar, to Leeds University. His interest in physical chemistry and chemical kinetics grew during his final year there and was inspired to a large extent by the teaching of M.G.Evans. During his final honours year he took a special course in radio physics and became, later in the year, an Officer in the Royal Naval Volunteer Reserve Special Branch, concerned with radar. The training which he received in electronics and pulse techniques was to prove useful later in suggesting new approaches to chemical problems.

Early in 1945, he went to Cambridge to work as a postgraduate research student with Professor R.G.W. Norrish. His first problem involved the study, by flow techniques, of free radicals produced in gaseous photochemical reactions. The idea of using short pulses of light, of shorter duration than the lifetime of the free radicals, occurred to him about a year later. He began the construction of an apparatus for this purpose in the early summer of 1947 and , together with Norrish, applied this to the study of gaseous free radicals and to combustion. Their collaboration continued until 1954 when Porter left Cambridge.

During 1949 there was an exciting period when the method was applied to a wide variety of gaseous substances. Porter still remembers the first appearance of the absorption spectra of new, transient substances in time resolved sequence, as they gradually appeared under the safelight of a dark room, as one of the most rewarding experiences of his life.

His subsequent work has been mainly concerned with showing how the flash-photolysis method can be extended and applied to many diverse problems of physics, chemistry and biology. He has made contributions to other techniques, particularly that of radical trapping and matrix stabilization .

After a short period at the British Rayon Research Association, where he applied the new methods to practical problems of dye fading and the phototendering of fabrics, he went, in 1955, to the University of Sheffield, as Professor of Physical Chemistry, and later as Head of Department and Firth Professor. In 1966 he became Director and Fullerian Professor of Chemistry at the Royal Institution in succession to Sir Lawrence Bragg. He is Director of the Davy Faraday Research laboratory of the Royal Institution. Here his research group is applying flash photolysis to the problem of photosynthesis and is extending these techniques into the nanosecond region and beyond.

Porter became a fellow of Emmanuel College, Cambridge, in 1952, and an honorary fellow in 1967. He was elected a Fellow of the Royal Society in 1960 and awarded the Davy Medal in 1971. He received the Corday-Morgan Medal of the Chemical Society in 1955, and was Tilden Lecturer of the Chemical Society in 1958 and Liversidege Lecturer in 1969. He has been President of the Chemical Society since 1970. He is Visiting Professor of University College London since 1967, and Honorary Professor of the University of Kent at Canterbury since 1966.

Porter holds Honorary D.Sc.'s from the following Universities: 1968, Utah, Salt Lake City (U.S.A.), Shefffield; 1970, East Anglia, Surrey and Durham; 1971, Leeds, Leicester, Heriot-Watt and City University. He is an honorary member of the New York Academy of Sciences (1968) and of the Academy "Leopoldina". He is President of the Comité International de Photobiologie since 1968. He was Knighted in January 1972.

He is interested in communication between scientists of different disciplines and between the scientist and the non-scientist, and has contributed to many films and television programmes. His main recreation is sailing.

From Nobel Lectures, Chemistry 1963-1970, Elsevier Publishing Company, Amsterdam, 1972

This autobiography/biography was written at the time of the award and later published in the book series Les Prix Nobel/Nobel/Nobel Lectures. The information is sometimes updated with an addendum submitted by the Laureate. To cite this document, always state the source as shown above.

Lord Porter died on August 31, 2002.

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The Nobel Prize in Chemistry - 1967
Presentation Speech by Professor H.A.Ölander, Member of the Nobel Committee for Chemistry of the Royal Swedish Academy of Sciences

Your Majesty, Your Royal Highnesses, Ladies and Gentlemen.

The chemists of older times were chiefly interested in how to produce substances from natural products which might prove useful; for example, metals from ores and the like. As a matter of course, they were bound to notice that some chemical reactions took place rapidly, while others proceeded much more slowly. However, systematic studies of reaction velocities were hardly undertaken before the mid-19th century. Somewhat later, in 1884, the Dutch chemist, Van't Hoff, summarized the mathematic laws which chemical reactions often follow. This work, together with other achievements, earned for Van't Hoff the first Nobel Prize for Chemistry in 1901.

Almost all chemical reactions will proceed more rapidly if the mixture is heated. Both Van't Hoff and Svante Arrhenius, who for other discoveries was awrded the third Nobel Prize for Chemistry in 1903, set up a mathematical formula which describes how the velocity of a reaction increases with temperature. This formula could be interpreted by the assumption that when two molecules collide, they usually part again and nothing happens; but if the collision is sufficiently violent, the molecules disintegrate and their atoms recombine into new molecules. One could also envisage the possibility that the molecules moved towards each other at moderate velocity, but that the atoms in one molecule oscillated violently so that no severe impact would be require for that molecule to disintegrate. It was already then realized that higher temperature implied two things: the molecules moved faster, and the atoms oscillated more violently. It was also realized that when a reaction velocity could be measured, only the merest fraction of the collisions involved really resulted in a reaction.

How fast were the reactions that could be measured in the old days? Considering that the substance first had to be mixed, after which samples had to be removed at specified times and then analyzed, the speed of the procedure was necessarily limited. The best case was if one could observe the change in some physical property such as colour; then it was not necessary to remove samples. The chemists had to read off his clock and measuring instrument, and then to make entries in his laboratory journal. If he was quick, he could keep up with a reaction which had run half its course in a few seconds.

How slow were the reactions one could measure? Eigen has said that this is determined by how long a time a young man wants to devote to his doctoral dissertation. If as a practical maximum we say that half the reaction is completed after three years, that comes to around 100 million seconds. Naturally, there are even slower reactions.

Many reactions were of course known to proceed at velocities so great as to defy measurements. For example, no one had succeeded in measuring the velocity of the reaction between an acid and an alkali. In such cases it was understood that the molecules reacted without the collision being very violent. In the study of reactions where a large number of molecules take part, it turned out that the velocity often depended on the quantities of

substances used in such a manner that a step-by-step sequence had to be assumed for the reaction: one of these steps was slow and hence determined the overall course of the reaction, while the other steps were immeasurably fast. The German chemist, Max Bodenstein, studied many such reactions at the beginning of this century.

A major advance was achieved in 1923 by the Englishmen, Hartridge and Roughton, who let two solutions arriving through separate tubes meet and be mixed, and then caused the mixture to flow swiftly through an outlet tube, in which the reaction could be observed as it proceeded. This method permitted measurement of reaction times down to thousandths of a second. But there are still many reactions that proceed still more rapidly. They could not be studied by this method for the simple reason that the substances cannot be mixed fast enough.

When nitric acid gets to react with a number of substances, a brown gas, nitrogen dioxide, is formed. This gas has certain properties which were interpreted by assuming that the brown molecules could form pairs, thus doubling their size. This was a typical example of a high-velocity reaction that no one has succeeded in measuring.

In 1901 a student studying for the doctorate with Walter Nernst investigated the velocity of sound in several gases, among them nitrogen dioxide. He found that the equilibrium between the single and double molecules was accomplished much more rapidly than the sound oscillations. But he perceived that the speed of sound ought to be modified if one used sufficiently high-pitched tones-far beyond the capacity of the human ear to hear. No less a person then Albert Einstein carried out a theoretical study of this phenomenon in 1920. However, many years were to elapse before instruments could be devised to measure it. A complication was found to be involved here in that the sound is absorbed by the gas. None the less, the principle is important; the essential point here is that one is not going to mix two things, but rather to start off from a chemical system in equilibrium and to disturb this equilibrium, in this case by exposing the gas to the condensations and attenuations which constitute sound.

The fact that light produces chemical reactions has been known since time immemorial. Thus it bleaches colours and alters silver salts, which action is the very basis of photography. The ability of light to produce a chemical reaction depends on its absorption by a molecule, which then becomes so excited that it can react. Investigations of the energy states thus acquired by molecules were begun some fifty years ago. One of the findings was that the atoms of a molecule oscillated at rates of the order of billionths of a second. Chemical reactions inevitably take longer, for time must be allowed for the atoms to dissociate and re-combine into new molecules. For these purposes the times required come to, say, one ten thousandth part of a millionth of a second. In other words, such are the times for the fastest chemical reactions. They amount to one-tenth of one-millionth of the times Hartridge and Roughton were able to measure with their method. To convey an idea of what one ten thousandth part of a millionth of a second means, it can be said to form the same part of one second as one second is of three hundred years.

The 1967 Nobel laureates in Chemistry have opened up the whole of this vast field of reaction kinetics for research. They did so by applying the principle I have just mentioned: to start from a system in equilibrium and to disturb this equilibrium suddenly by one means or another.

If a molecule has absorbed light so that it can react, it usually does this so fast that too few of these activated molecules are present at any one time to reveal their existence by any known method of analysis.

Ever since the 1920's, Professor Norrish has been studying reaction kinetics and he was one of the leading scientists in this field. A younger associate

joined him in the late 1940's in the person of George Porter. They decided to make use of a flash lamp, the kind you have seen photographers use. The only difference was that they made their lamp thousands of times more powerful. Indeed, subsequent refinements have led to the construction of such lamps with an effect greater than the total effect which the whole city of Stockholm consumes on a winter afternoon with the lights turned on and the factories still humming before closing time-and that is 600000 kilowatts. There is just one catch, however; this enormous effect in the lamp lasts no more than onemillionth of a second or so. Still, in this way much if not most of a substance in a tube next to the flash lamp can be converted into an activated form, or the molecules broken up so as to yield atom groups with a high reactivity. It then becomes possible to study these newly formed molecules spectroscopically, but since they react so readily, this must be made extremely fast. Thanks to modern electronic equipment, however, these rapid processes can be recorded.

The new method developed by Norrish and Porter enabled them to study at first hand many fast reactions which one had previously only guessed that they took place. I cannot begin to enumerate even a sample of the reactions which Norrish and Porter, not to mention a great many other scientists, have linvestigated with this method. Suffice it to say that, in an earlier day, the study of these short-lived high-energy molecules and their chemical characteristics could hardly even have been contemplated as a wild dream.

The flash photolysis method of Norrish and Porter inflicts a drastic change of behaviour on the molecules. By contrast, Eigen treats his molecules more leniently. In 1953 he and two associates published a study on the absorption of sound in a number of salt solutions. The theoretical part of their report demonstrated how this absorption could be used to estimate the velocity of fast reactions which take place in the solution. Thus a solution of magnesium sulphate contains ions of magnesium and sulphate, as well as undissociated salt molecules. Equilibrium sets in after about 1/100000 of a second. This causes that sound which oscillates 100000 times a second is absorbed by the solution.

Eigen has invented several methods, however. If, say, a solution of acetic acid is subjected to a high-tension electric pulse, more molecules of this substance are dissociated than else would be the case in an aqueous solution. That takes a certain length of time. When the electric pulse is turned off, the solution goes back to its former equilibrium; this also takes some time, and that relaxation can be recorded.

The shock current caused by the application of the high-tension pulse will heat the solution a few degrees. Most chemical equilibria are slightly displaced when the temperature is changed, and the rapid establishment of the new equilibrium after heating can be recorded.

Eigen has also specified other methods for starting fast reactions in a solution formerly in equilibrium.

Whereas the study of electrolytic dissociation equilibria was already commenced in the 1880's by Svante Arrhenius, it is now possible to measure the reaction velocities at which these equilibria are established. A large number of extremely fast reactions can now be studied, involving all kinds of molecules ranging from the very simplest ones to the most complex that the biochemists work with.

Although Eigen starts his reactions in another way than that employed by Norrish and Porter, the instruments that record the fast reactions are largely identical for both research groups.

The chief importance to chemists of the methods worked out by Eigen, Norrish and Porter is their usefulness for the most widely diverse problems. A great many laboratories round the world are now obtaining hitherto undreamt-of results with these

methods, which thereby fill what used to be a severely-felt gap in the means of advance available to Chemistry.

Professor Dr. Manfred Eigen. Although chemists had long been talking of instantaneous reactions, they had no way of determining the actual reaction rates. There were many very important reactions of this type, such as the neutralization of acids with alkalis. Thanks to you, chemists now have a whole range of methods that can be used to follow these rapid processes, so that this large gap in our chemical knowledge has now been filled.

May I convey to you the warmest congratulations of the Royal Swedish Academy of Sciences.

Professor Ronald George Wreyford Norrish, Professor George Porter. Photo-reactions have been studied by chemists for more than two hundred years, but the detailed knowledge of the behaviour of the activated molecules was meager and most unsatisfactory. By your flash photolysis method you have provided us with a powerful tool for the study of the various states of molecules and the transfer of energy between them.

May I convey to you the warmest congratulations of the Royal Swedish Academy of Sciences. Professor Eigen. May I ask you to come forward to receive the Nobel Prize for Chemistry from His Majesty the King.

Professor Norrish, Professor Porter. May I request you to receive the Nobel Prize for Chemistry from the hands of His Majesty the King.

From Nobel Lectures, Chemistry 1963-1970, Elsevier Publishing Company, Amsterdam, 1972

Kalinga Laureate for Popularization of Science - 1976

Professor Alexander Ivanovich Oparin, USSR

[Born: 2nd March, 1894 in the Old Russian City Uglitsch
(Jaroslavl), located to borders of the Volga River
Died : 21st April, 1980, Moscow]

There is no fundamental difference between a living Organism and Lifeless matter. The complex combination of manifestations and properties so characteristics of life must have arisen in the process of the evolution of matter.

....Alexander Oparin

Oparin, Aleksandr Ivanovich (1894-1980)
A Brief Biographical Profile

Russian biochemist who, in 1924, wrote a pamphlet on the origin of life (based on ideas presented at the Russian Botanical Society in 1922) and provided what Bernal called "the first and principal modern appreciation of the problem". His writings only reached the West, however, in the late 1930s[1].

Although Oparin began by reviewing the various panspermia theories, he was primarily interested in how life initially began. He asserted.

There is no fundamental difference between a living organism and lifeless matter. The complex combination of manifestations and properties so characteristic of life must have arisen in the process of the evolution of matter.

But what was that process? Taking into account the recent discovery of methane in the atmospheres of Jupiter and the other giant planets, Oparin postulated that the infant Earth had possessed a strongly reducing atmosphere, containing methane, ammonia, hydrogen, and water vapor. In his opinion, these were the raw materials for the evolution of life.

At first there were the simple solutions of organic substances, the behavior of which was governed by the properties of their component atoms and the arrangement of those atoms in the molecular structure. But gradually, as the result of growth and increased complexity of the molecules, new properties have come into being and a new colloidal-chemical order was imposed on the more simple organic chemical relations. These newer properties wee determined by the spatial arrangement and mutual relationship of the molecules…In this process biological orderliness already comes into prominence. Competition, speed of growth, struggle for existence and, finally, natural selection determined such a form of material organization which is characteristic of living things of the present time.

Oparin outlined a way in which basic organic chemicals might form into microscopic localized systems-possible precursors of cells-from which primitive living things could develop. He cited the work done by de Jong on coacervates and other experimental studies, including his own, into organic chemicals which, in solution, may spontaneously form droplets and layers. Oparin suggested that different types of coacervates might have formed in the Earth's primordial ocean and, subsequently, been subject to a selection process leading eventually to life.

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1. Oparin, A.I. The Origin of Life. New York: Dover (1952) (first published in 1938).
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Alexander Ivanovich Oparin was a Soviet biochemist and author of the theory of the origin of life. His other major works were in fields of biochemical grounds for vegetable raw material processing and enzyme reactions in plant cells. He showed that many food production processes are based on the biocatalysis and developed foundations of the industrial biochemistry in the USSR. [3]

Life :

Oparin was born in Uglich. He graduated from the Moscow State University in 1917. In 1924 he put forward a theory of life on Earth developing through gradual chemical evolution of carbon-based molecules in *primeval soup*. In 1935, he along with academician Aleksei Bakh, founded the Biochemistry Institute by the USSR

Academy of Sciences. [1] In 1939 Oparin became a Corresponding Member of the USSR Academy of Sciences, and in 1946 – a full member of the Academy. In 1940s and 1950s he supported pseudo-scientific theories of Trofim Lysenko and Olga Lepshinskaya, who made claims about "the origin of cells from noncellular matter", and 'taking the party line' helped his career[2]. In 1970, he was elected President of the International Society for the Study of the Origins of Life. On his passing on April 21, 1980, he was interred in Novodevichy Cemetery in Moscow.

Oparin became Heor of Socialist Labour in 1969, received the Lenin Prize in 1974 and was awarded the Lomonosov Gold Medal in 1979 "for outstanding achievements in biochemistry". He was also awarded five Orders of Lenin.

Theory of the origin of life :

Oparin sometimes is called "Darwin of the 20th century." Although he began by reviewing the various panspermia theories, he was primarily interested in how life initially began. As early as 1922, he asserted the following tenets:

1. There is no fundamental difference between a living organism and lifeless matter. The complex combination of manifestations and properties so characteristic of life must have arisen in the process of the evolution of matter.
2. Taking into account the recent discovery of methane in the atmospheres of Jupiter and the other giant planets, Oparin postulated that the infant Earth had possessed a strongly reducing atmosphere, containing methane, ammonia, hydrogen, and water vapor. In his opinion, these wee the raw materials for the evolution of life.
3. At first there were the simple solutions of organic substances, the behavior of which was governed by the properties of their component atoms and the arrangement of those atoms in the molecular structure. But gradually, as the result of growth and increased complexity of the molecules, new properties have come into being and a new colloidal-chemical order was imposed on the more simple organic chemical relations. These newer properties were determined by the spatial arrangement and mutual relationship of the molecules.
4. In this process biological orderliness already comes into prominence. Competition, speed of growth, struggle for existence and, finally, natural selection determined such a form of material organization which is characteristic of living things of the present time.

Oparin outlined a way in which basic organic chemicals might form into microscopic localized systems-possible precursors of cells-from which primitive living things could develop. He cited the work done by de Jong on coacervates and other experimental studies, including his own, into organic chemicals which, in solution, may spontaneously form droplets and layers. Oparin suggested that different types of coacervates might have formed in the Earth's primordial ocean and, subsequently, been subject to a selection process leading eventually to life.

While Oparin was unable to do extensive experiments to investigate any of these ideas, scientists were later able to . In 1953, for example, Stanley Miller performed what is perhaps the first experiment to investigate whether chemical self-organization would have been possible on the early earth. He showed that by mixing many of the components of a reducing atmosphere, it was possible to synthesize familiar organic compounds such as amino acids that were more complex than the molecules that were present at the beginning of the experiment.

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Major works :

- "The External Factors in Enzyme Interactions Within a Plant Cell"
- "The Origin of Life on Earth"
- "Life, Its Nature, Origin and Evolution"
- "The History of the Theory of Genesis and Evolution of Life"

Footnotes :

1. Great Soviet Encyclopedia, 3rd edition, available online here (http://slovari.yandex.ru/art.xml?art=bse/00055/25700.htm)
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❑

Alexander Ivanovich Oparin

Russian Biochemist **He Postulated and He Wrote (1894-1980) The Origin of the Life**

Alexander Ivanovich Oparin was Russian of birth, vegetal physiologist or race, biochemist by vocation. He was born in 1894 in Uglich. He studied, and later he taught, in the University of Moscow. The theory that he developed in years 20 was the germ of the present vision on the origin of the life.

When Oparin was university student, the Russian biologists taught that the first alive beings had been autótrofos (able to make its own food, as the plants), and they had formed by spontaneous generation from grumos of coal. To Oparin, that had read and accepted the Theory of the Evolution of Darwin, the idea did not close to him. " I did no manage to imagine the sudden appearance of a photosynthetic cell from dioxide of carbon, nitrogen and water- Oparin wrote- . For that reason, I reached the conclusion that first they must have arisen, by means of a nonbiological process, the organic substances of which they formed, more ahead, the first alive beings, organisms that were heterótrofos in the beginning and were fed on the organic substances of the atmosphere."

On 3rd March 1922, Oparin presented/displayed his position in a meeting of the Russian Botanical Society, of which he was member. He listened and reprobated with equal courtesy. It was a theoretical speculation that lacked experimental support.

Without losing heart, Oparin wrote a titled booklet the origin of the life. With certain reluctance, and in spite of the full rejection of a scientific referee, the work was published by the publishing house Moscovita Worker. It was left on sale in November of 1923 (although it had been date of 1924 edition). It was sold well. Soon one became a bibliographical peculiarity. Outside Russia one practically did not spread until 1965.

Of the simple thing to the complex :

In 1936, Oparin presented/displayed a version reviews and extended of the Origin of the life. He maintained: the carbon thrown by vocanos was combined with water steam, forming bydrocarbons. In the ocean, those molecules became more complex and they crowded Little by little in called gotitas coacervados-acervus, in Latin, means pile-., the coacervados ones were acquiring the characteristics of the alive cells. Those cells were anaeróbicos microbes, because at that time there was no oxygen in the atmosphere.

Oparin explained the origin of the life in terms of physical and chemical processes. A progression of simplest to most complex. It broke therefore the vicious circle that affirmed that the present substances in the alive beings only could be made by the alive beings. The second version of the origin of the life was translated to the English by the North American publishing house Mac Millan, in 1938.

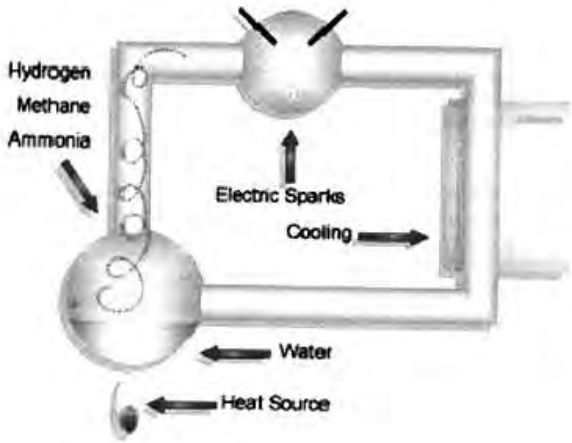
His theory was experienced with validity by Stanely Miller in 1953, like part of his doctoral thesis directed by H. Urey, obtaining to obtain complex organic compounds after reproducing the primitive conditions of the planet in an apparatus designed to the effect.

ORIGINS OF LIFE

The theory put forth to explain the origins of the Universe, our solar system, and our planet is called the **Big Bang Theory**. The Big Bang Theory IS NOT EVOLUTION! (The theory of evolution deals with living organisms, once they have come into existence.) The Big Bang theory says that all mater in the Universe was, at one time, concentrated in a giant mass (a black hole?) that blew apart about 10-20 bya (billion years ago) and is still expanding. About 5 bya, some of the matter condensed until forces were so strong that thermonuclear reactions began, and this was the origin of our sun. A disk-shaped cloud of matter orbiting the sun subsequently condensed into the planets. Thus, about 4.6 bya, the planets coalesced, and it is thought that Earth began as cold world. Later, due to whatever factors, the planet heated up enough to melt and sort into layers by density (core, mantle, crust). It is thought that the very first **atmosphere**

may have been hydrogen gas, but since that is so light weight and very chemically reactive, most of it would have floated off into space or reacted with other substances, thus would have been rapidly dissipated.

Alexander Ivanovich Oparin (publ. 1936), a Russian scientist, in *The Origins of Life,* described hypothetical conditions which he felt would have been necessary for life to first come into existence on early Earth. This, thus, is referred to as the



Oparin Hypothesis. He theorized that the first atmosphere was made largely of water vapor (H_2O), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen (N_2), methane (CH_4), and ammonia (NH_3) As the surface of Earth cooled again, torrential rains of this mixture formed the first seas, the "primordial soup." Some think this may be what conditions are like, even now, on Venus. Lightening, ultraviolet (UV) radiation, volcanic action all were more intense than they are now.

Several possible steps/stages were suggested to get from there to living organisms. The first step is thought to have been the **abiotic** synthesis (**syn**=with, together; **thesis**=an arranging) of organic **monomers**, in other words, putting inorganic chemicals like methane, carbon dioxide, and ammonia together to form simple organic chemicals like amino acids, simple sugars, fatty acids, and nucleic acids. This portion of the hypothesis was later tested by an experiment done by Stanley Miller as a grad student under Harold Urey in 1953. He used a sterile, enclosed system consisting of a flask over a heat source, a spark

chamber, and various other tubing (see illustration). He added sterile H_2O, H_2, CH_4,and NH_3 to the sealed system. Heat was applied under the flask to simulate volcanic action, and this was enough to turn a significant portion of the water into steam. A spark chamber periodically discharged electricity into the gasses to simulate lightening. In the return tube, the mixture was cooled to condense the water back into liquid, along with any organic compounds that might have formed from the mixture. Water and all the gasses Miller included are all "clear," thus his experiment started out with transparent water and transparent gasses. However, after only one week, Miller had a brown, murky soup. Subsequent chemical analysis showed the presence of a number of amino acids and other organic compounds. Other researchers have since tried similar experiments with slight variations in the initial mix of chemicals added, and by now, all 20 amino acids, and a number of sugars, lipids, and nucleotides have been obtained in this manner. From this experiment, scientists generalize that if this can happen in a lab, it could have happened in a similar way on early Earth. Note that ALL that was made here was simple organic chemicals!

The next step in going from non-living to living is thought to have been the abiotic synthesis of organic **polymers,** possibly using hot sand or finely divided clay as a catalyst (**cata**=down, downward; **lysis**=loosen, break apart), a substance which helps a chemical reaction to go without being consumed in that reaction, which caused **dehydration synthesis** to occur, thereby joining the smaller molecules into larger **macromolecules** such as proteins, carbohydrates, RNA or lipids.

Thirdly, it is thought that non-living aggregates of these polymers formed. These may have exhibited some properties characteristic of living organisms, but were NOT ALIVE, and did not have all the properties of living organisms. In a research laboratory, scientists have seen mixtures of proteins, lipids, and carbohydrates form globules. If the proteins involved happen to be enzymes, these globules can even carry on "metabolic"activity, although they have no means to replicate themselves. Simultaneous to this, the genetic code would have to have arisen. Several widely-accepted theories as to how this may have happened include the possibly involvement of damp, zinc-containing clay as a catalyst to help the nucleotides polymerize first into RNA, and later into DNA.

It is thought, then, that about 4.1 to 3.5 bya, the first **prokaryotes,** organisms without a true nucleus (like bacteria) came into existence. It is difficult to pinpoint a date for this because bacteria don't have skeletons to leave behind. The first "fossils" (remains of colonies/secretions) of prokaryotes seem to be this age. These would have been very simple cells without many of the organelles present in modern cells, especially modern eukaryotes.

Note that while some of these steps have been demonstrated in a lab, **Nobaoy Has Ever Made a Living Cell in a lab.** While people have demonstrated bits and pieces of this process, the whole process has never been done in a lab. Rather, this is a theory of how things might have happened.

Once the first cells, the first living organisms, the first prokaryotes came into existence, then the Theory of Evolution takes over to provide an explanation for how (not why) these primitive cells diversified into the five kingdoms of life which we recognize today.

Kalinga Laureate for Popularization of Science – 1977

Professor Fernand Seguin, Canada

[Born : 9th June,1922, Montreal, Canada
Died : 19th June, 1988, Montreal, Canada]

Of our first cry to our last breath, our existence wears as well as the stone with the play of the rebounds, to distinguished the crystal from with the dream, lasts its reality of with the Fantasms which invents our imagination in the hope to escape the banality from the daily news Paper. [...] To Confuse the crystal & the dream with the research always started again of inaccessible, it is a sometimes attractive play, sometimes cruel. ***.... Ferknand Seguin.***

Fernand Seguin
Biographical Sketch

Deceased in June 1988, at the 66 years age, Mr Fernand-Seguin can be regarded indisputably as one of largest if not the largest professor of sciences which Quebec knew. Holder of a training of biologist and biochemist, Mr Seguin was initially, from 1945 to 1954, enquiring professor in physiology then in biochemistry. But it is especially by way of transfer scientist that he was most known and that he undoubtedly left the greatest memories. Since 1947 , he animated and took part in several scientific emissions with the radio and the television of Radio-Canda of which Science in Slippers, The Novel of Sciences, Science and You, Science Reality and, more recently, Today Science. He also took part, between 1954 and 1962, with more than 250 films of Scientific Popularization. Who as does not have in memory the marvellous moments as he knew to create with his guests with the general data transmission, The Salt of the Week, from 1965 to 1970, Man of a Field Crop, Pedagogue and Humanistic, he had seen his qualities recognized on several occasions. In 1977, he received the Kalinga Prize of UNESCO which “rewards a person who contributed in an exceptional way to comprehension of science and of her stakes in company”; in March 1988, he received the Sandford-Fleming Medal of the Royal Institute of Canada. We can only wish that which had known to make science so interesting and alive for general public that is to say a constant inspiration for all those which are in charge of this mission at the school. Mr Fernand Seguin is deceased in 1988.

Fernand Seguin was born on June 9, 1922, in Montreal. He made initially his primary studies at the Louis-Hippolyte-Lafontaine school of 1929 to 1937. He continued then his secondary studies at the higher School the Plate, from 1937 to 1940. To the autumn 1940, he entered to the Faculty of Science of the University of Montreal where he obtained, in 1944, a science degree chemical follow-up, in 1945, of a science control biological. The same year that he obtained his control relating “to a method of determination of the aminopyrine (sic) in the blood, which was worth the Casgrain – Charbonneau Prize to him”, Seguin undertook his career of teacher to the Faculty of Science of the University which had formed it. He taught there until 1948 general physiology and since 1947, an advanced course of biology and cellular biochemistry gave the students who intended themselves for the control. In parallel, he carried out the research undertaken into 1943-1944 pennies the direction of professor Louis-Paul Dugal. This research was going to finish in 1948. Fernand Seguin was very active within the university community. Student, he was a regular speaker with the verbal sparring matches of the Company of the debates of the University of Montreal, then, since 1943, collaborator with the newspaper studied the Latin Quarter like criticism of the cultural life.

In 1947, he accepted the invitation of his professor of chemistry, Leon Lortie, and became chronicler with Radio-College. Produced in the studios of the Company Radio-Canada, this emission, inaugurated in 1941 per Leon Lortie himself, wanted to be “a complement with the teaching of

the colleges, a kind of school of Sunday which is addressed as well to general public with the students".

The same year that he was initiated in the radiophonic world, Seguin became scientific chronicler with the newspaper Our time. This newspaper published the scientific texts of young professor Seguin but also of other texts written under the pseudonym of Agathonide. Under this name of loan, Seguin became a frightening lampoonist then and denounced what he regarded as being the incurie administration of the University of Montreal. Since 1948, Agathonide yielded the place to Ingenuous whose interests were more cultural but the feather always so sharp-edged…

His chronicles with Radio-College continued whereas Seguin left, in 1948, the University of Montreal for a station at the School of Medical Technology of the Saint-Jean-de-Dieu hospital. He would continue there his career as teacher and researcher in the field of the psychoses. Indeed, "at the time when Fernand left the University of Montreal, George Préfontaine had discreetly suggested a subject of research to him (…) This simple gesture was going to direct research of his pupil for the six years to come".

The refusal of his thesis of doctorate by the University of Montreal did not prevent him from founding, in 1950, the Department of Biochemical Research at the Saint-Jean-de-Dieu hospital. "Research of this time related to the biochemical aspects of schizophrenia, which appeared revolutionist then. In particular, Fernand developed a spectrophotometric method of diagnosis of the schizophrenia, based on the presence, in the céphalo-rachidian liquid, of breakdown products of the ribonucleic acid. He also tried clinical trials of biochemical treatment of the schizophrenia whose results were extremely encouraging."

Simultaneously with his research tasks, his collaboration with Radio-College always continued. "Of oracles to penicillin" (1949-1950), "One half-century of biological conquests" (1950), "The knowledge of the man: cell with the thought" (1951), etc are only some titles of the radiophonic conferences that Fernand Seguin pronounced at this" school of Sunday". He prepared there also the small dramatic ones, "The Scientific Adventures", which recalled the great moments of the life of famous scientists.

In 1951, he held a chronicle of theatre with the radio broadcast the Review of Arts and Letters and published an article in the Culture review entitled "Biology and Humanism", which wanted to make reflect on the development of science. It is also during this same year, that he started to animate, with André Roche, the variety programme White Carte presented at the radio of Radio-Canada. With this emission, "Fernand [could] to become again (…) the lampoonist who hid at one time under the pseudonyms of Agathonide and Ingenuous, [and to denounce] the weaknesses, manias and them through ridiculous of the company québécoise".

Fernand Seguin was one of the pioneers of the television, which made his entry in the Canadian hearths in 1952. His first participation in an emission of television was to animate a play questionnaire which was entitled The Crossroads of the Words. The same year, he animated also the official reception Miss Radio-World and found time to publish his Talks on the Life (1952).

Despite everything his media activities, Seguin always continued his research on the psychoses at the School of Medical Technology. "But this work, continued under difficult conditions, was to run up in 1954 with a refusal of financing on behalf of the authorities. The year 1954 thus marked a turning Point in the career of Fernand. Vis-à-vis the practical impossibility continuing his career of teacher and researcher, he chose audio-visual popular education…".

With the autumn of 1954, Science in Slippers was the first scientific emission of popularization for television. The formula was new. “With this first televised series, Fernand is likely finally to try out his personal design of the scientific popularization. He creates the scenarios, writes the texts and conceives all the experiments of demonstration”. The joy of knowing followed in 1955 and held the antenna until 1957 whereas the Novel of Science took the changing. Came then, By (1957-1961), The Border Keyhole of Science (1960-1961) and Man in front of Science (1961). All these films made for television were produced in the studios of the Niagara films whose Fernand Seguin became the principal shareholder in 1956. This company proposed, produced and carried out films to then sell them in Radio-Canada so that they are diffused. In addition to the series in scientific matters, the Niagara films produced also series in cultural matter like Extraordinary Histories. This series of films made for television presented film adaptations the great classic of the fantastic literature.

Simultaneously with his activities of producer of cinema, Seguin continued to make hear his voice with the radio with emissions such as Rencontres, The rainbow, Esquisse for a Portrait, Université 61 and Two votes… a country (1962). He also took part, at the same time, many emissions of television very varied in particular at This Evening or Never (1962), a variety programme, and Political newses (1962-1965). During the season of 1965, he coanima two broadcasts television with Gerard Furrier. Initially transatlantic Dialogue within the framework of the Canada-Switzerland week, to then explore the political world with emission P.S. A new emission animated by Seguin, was presented at the television of Radio-Canada this same season, which was going to know a long life and a very great popularity. Indeed, the Salt of the week knew, between 1965 and 1970, three different formulas and more than 95 emissions. From 1965 to 1966, Seguin also occupied the radiophonic waves of Radio-Canada with Connaissances today.

In 1970, the end of the Salt of the week gave a new rise to the career of Fernand Seguin. Thus after having discussed with the greatest international personalities, Seguin turned over to the scientific popularization. One could then hear him in Magazine Science (1970-1971) then with Science and you, emission that he coanima as a scientific chronicler from 1971 to 1979. Meanwhile, one could see him with the television broadcast Science-Reality (1975-1978). Simultaneously with his work in Radio-Canada, he undertook in 1976 a collaboration with Radio-Quebec. It resulted from it the Files health and the imaginary doctor. In 1977, Seguin presented at the television of Radio-Canada, a significant file on cancer; file which he had already prepared for a few years. Since 1978, he returned to Radio-Quebec, this time for a series of courses televised, bearing on the human body, of which he was the originator and the scientific adviser. The following year, the film The three brains was presented at Radio-Canada. It was about a film produced by the O.N.F. whose Seguin, in collaboration with the realizer, had made research, writes the texts and the scenarios. This year, he also took part in the emission Antenna-5 with the radio of Radio-Canada (1979-1981).

As from the years 1980, reasons of health obliged Fernand Seguin to limit his appearances to television to concentrate on his work of scientific chronicler to the radio. One could still see him with the broadcast television Femme of today where he held, in 1980, a chronicle on the environment. But it is with the radio broadcast Today the Science, from 1981 to 1988, which he exerted mainly his trade of scientific popularizer. If he ceased presenting his radiophonic chronicles since 1985, he did not continue any less to write the texts. Since 1984, he collaborated regularly in Dimension Science, Quebec Science and Science and Technology,

magazines for which he wrote scientific chronicles. Especially he prepared, starting from his radiophonic chronicles which he altered, his works The Bomb and the Orchis (1987) and Crystal and the Dream (1988) published both with the editions Free expression. Fernand Seguin died out on June 19, 1988 at the 66 years age.

During his long career, Fernand Seguin was member elect of several prizes. Thus, he obtained in 1961 the Archambault Medal of the ACFAS. In 1968, the Prize Méritas better interviewer came to reward his work, in particular with The Salt of the Week. In 1977, he received the Olivar-Asselin Prize which decreed to him the Saint-Jean-Baptiste Company. The following year, the Prize Kalinga-1977 came to devote the man who had dedicated his life with the scientific popularization. The same year, he was named Offcier of the Order of Canada (1978). He also accepted the title of honorary doctor of the universities Sherbrooke (1975), Concordia (1979), Montreal (1980) and of the University of Quebec (1984). In 1985, he was promoted as Officier of the National Order of Quebec. Lastly, in 1988, he received the Medal Sandford Flemming, the Medal of Canadian Medical Association and was accepted Compagnon of the order of Canada.

Several homages were paid to Fernand Seguin of which this one:

"That one does not mistake on the direction of the word: one is born noble, but one becomes aristocrat . It is the word which initially came to me to evoke the memory this being of quality" of Radio-Canada.

Kalinga Laureate for Popularization of Science – 1978

Hoimar von Ditfurth, F.R. Germany

[Born : 15th October, 1921, Berlin
Died : 1st November, 1989, Freiburg]

Everyone wonders at some point, where he was after his death will be, but no body asks where he was before his birth. ***….. Hoimar Von Ditfurth***

"We are Creatures of transition",

…Hoimar Von Ditfurth in his last TV interview with Dieter Zilligen, a freelancer for Radio and Television.

Hoimar von Ditfurth

Freelance Lecturer, Publisher, Author
&
One of the Most Distinctive Science Journalists in Germany.

A Biographical Sketch

Biography

The subsequent biographical details are mainly taken from Hoimar von Ditfurth's books *Innenansichten eines Artgenossen* (A same type man's insight view-Reflections by a Member of the Species – his autobiography) and *Das Gespräch* (The Conversation – his last TV interview).

Family

Hoimar Gerhard Friedrich Ernst von Ditfurth was born on October 15, 1921 in Berlin (Charlottenburg). He originated from the family of the national conservative Prussian cavalry captain (Rittmeister) and later classical scholar Hans-Otto von Ditfurth. Until his first day in school in Potsdam, Hoimar von Ditfurth lived in Berlin and Lensahn.

1949 he married Heilwig von Raven.

Together they had four children : Jutta (*1951), Wolf-Christian (*1953),

Donata-Friederike (*1956) and York-Alexander (*1957).

Hoimar von Ditfurth died on November 1, 1989 in Freiburg/Breisgau of a thymom (cancer of the thymus gland). He is buried in Staufen.

Education

1939 Hoimar von Ditfurth graduated from the Victoria-Gymnasium (college) in Potsdam. Afterwards he studied medicine, psychology and philosophy at the universities of Berlin and Hamburg, where he attained his Ph. D. in medicine in July 1946.

Profession

Between 1948 and 1960 Hoimar von Ditfurth worked at the university hospital in Wüzburg (in the end as senior physician). 1959 he qualified himself as a university lecturer there and became outside lecturer for psychiatry and neurology. 1967 and 1968 he was appointed associate professor of the medical faculty at the universities of Würzburg and Heidelberg. 1960 Hoimar von Ditfurth took a job in the pharmaceutical company C.F. Boehringer in Mannheim, where he managed the "Psycho Lab" being responsible for the development and clinical testing of psycho drugs. Although Hoimar von Ditfurth was offered a position in the board of executives, he left Boehringer in 1969 ("…I don't want to sacrifice my intellectual independence…") and became a freelance lecturer, publisher, author and one of the most distinctive science journalists in Germany.

Publishing Activities

Hoimar von Ditfurth's popularity in Germany is based on numerous articles in newspapers, radio broadcasts (between 1963 and 1983), and TV shows (between 1971 and 1983) with various popular scientific subjects. In 1970 his first book, Children of the Universe (=Kinder des Weltalls), was published. This and his following books made him the most competent and best selling scientific

writer in Germany. Many of his books were translated into other languages.

He also was editor and publisher of miscellaneous scientific magazines, publications and samplers, to which many famous national and international scientists provided contributions.

Between 1971 and 1983 Hoimar von Ditfurth hosted the popular TV science show *Querschnitte* (=cross-sections) in which he showed his extraordinary talent to make complex scientific contents understandable to a broad audience. One of his major targets always was to position natural science equally besides arts science which he thought is overrated in the western cultural society. He was also a committed and eloquent fighter against all kinds of superstition and obscure "pseudo science".

Ecological Engagement

Starting in the late 70s, Hoimar von Ditfurth concentrated more and more on ecological subjects. He became a critic of the western "credo in progress and economical growth". Even though he proclaimed that manking would destroy itself by environmental pollution and destruction, overpopulation and (nuclear) armament, he never was a fatalist. He always maintained his hope and true humanistic approach.

Hoimar von Dittfurth was a committed pacifist.

In the 80s he supported the German Green Party during their election campaigns, but without getting involved in political activism and always keeping a critical distance to extreme ideological positions.

Awards & Prizes

Hoimar von Ditfurth was a member of the German PEN-Center and holder of numerous national and international awards and prizes.

In 1978 he received the UNESCO UNESCO Kalinga-Prize for his lifetime achievements as author and publisher.

Bibliography

Children of the Universe

With the discoveries of Galileo and Copernicus men lost the illusion of a friendly universe. The conviction that we are isolated in the boudless emptiness of space has had consequences far more radical than anyone could have foreseen.

Scientists are now discovering that such a view is false. New findings are revolutionizing our understanding of the universe and with reviting clarity Hoimar von Ditfurth argues that until recently we misinterpreted many of the discoveries of science. Suddenly a new vision of the universe is emerging. The universe is not a cold or hostile void. Instead, the earth is a focal point where intricate forces have come together and spun the web of life.

Astronomy and space exploration have disclosed a hitherto unknown, invisible net of connections between life on earth and in the debths of the universe. Von Ditfurth vividly discusses and lucidly describes not only fascinating facets of galactic architecture such as the nature of time, the size of the universe, the influence of the moon and the birth and death of stars, but also the beginnings of life on earth and the dramatic shifts in human evolution.

Children of the Universe is set in the landscape of Genesis. It is no lesser tale than the tale of our existence. In Germany it topped the bestseller list for months. It has been translated into many languages.

***

THE ORIGINS OF LIFE-

EVOLUTION AS CREATION

A#1 bestseller in Germany (over 200.000 copies

sold), The Origins of Life offers a stimulating, visionary account of the evolution of life fully compatible with a theory of creation – all presented in the tradition of Lewis Thomas, Konard Lorenz, Loren Eiseley. Hoimar von Ditfurth, a distinguished German scientist, guides us surely and compellingly from cosmic genesis to a brilliantly articulated glimpse of a distant future an a dimension beyond the material world.

The Origins of Life opens with a lucid, fascinating explanation of evolutionary process – not only in biology, but in molecular physics, astronomy, and other fields- to outline the path from primal amino acids to human beings. Ditfurth demonstrates how the scientific theory of evolution is unimpeachable and essential to how the whole of modern science operates. But he simultaneously points out that the deeper science probes the nature of things- subatomic particles to the end of the cosmos – the more it discovers a dimension of spirit or mystery beyond matter and scientific measurement.

The Origins of Life goes right to the heart of the creation / evolution controversy to show that fundamentalists who reject evolution out of hand are as misguided as scientists who think a purely materialistic account of life's source and purpose is sufficient. Countering these limited views, Ditfurth offers a brilliant picture of the richness of reality that far outstrips current models. His exciting ideas suggest that evolution may be creation seen from a limited human perspective; in the unfolding process of the universe, he detects an "inner wisdom" that suggests science and religion may simply be using different vocabularies to express identical truths.

Ditfurth skillfully translates complex ideas and unfamiliar notions into clear, everyday language, yet never reduces his material to simplistic terms. Beautifully written, The Origins of Life reminds us forcefully of the limitations of dogmatic explanantions, while it celebrates the infinite possibilities of the universe. In creatively reconciling apparent contradictions between religion and science, The Origins of Life argues convincingly that both must contribute to answering the basic questions of the nature of the universe and our place in the scheme of things.

Reader's comments in English:

I think this is perhaps one of the best synthesis between the two theories that I have read. Ditfurth points out theological problems with the Creationists, and says that Christians should be amazed that the miracle of evolution occurred, rather than claiming that "God is what we don't know".

[David W. Ussery, Associate Professor ,

The Technical University of Denmark]

Those who give serious attention to the ideas presented in the volume will be challenged to view science and religion in a new and creative way. The book is well worth reading, despite the uneven style of writing.

[Richard W.Berry,

San Diego State Universiy]

The author's conclusion that we as humans are possibly all taking part in the creation might appear somewhat bold, but is in no way far fetched. The book offers an extremely valuable survey of different thoughts about the subject of reconciling science with religion, starting with Plato's Allegory of the Cave, and it gradually becomes very clear that science and religion as well as creation and evolution have in no way to be conflicting concepts. One of the more prominent topics treated in this book is the fact, that by definition, the scope of natural science is limited to the study of physical phenomena – a fact which scientists are too eager to forget when disregarding spiritual phenomena on the ground that they are not 'scientifically provable'. Some thoughts about evolution are included, one being a critical look at the notion that mankind is the 'end product' of evolution – we

should rather regard ourselves as an intermediate product, flawed and far from perfect. A further comment regarding evolution is the observation that all physical constants seem to be tailor-made for evolution to have to occur- if one of the constants would be slightly different, evolution would not be able to take place at all. Generally, the thoughts are presented in a very systematic ways, and the book is written in a beautiful style.

[found on amazon.com]

A comment to "So lasst uns denn ein Apfelbaeumchen pflanzen" (Now, let's plant a little apple tree):

Hoimar von Ditfurth is a Neurologist and Scientist that really knows how to write. He is easily in the same category as Carl Sagan. Unfortunately, he died November 1st 1989. The book is a serious showdown of the State of the Planet Earth and its possible end. Ditfurth shows that the planet is out of balance and squeaks. The political errors created by the different ruling societies and the ecological problems created by humans threaten to literally blow-up the entire globe. Our arrogant and egocentric omnipotence might as well be our own death sentence. But there is hope. "So let us plant a little Apple Tree" is the translation of the title of this great book.

[Eric Jucker,

found on amazon.com]

Year Title

1970 **Kinder des Weltalls**

(Children of the Universe)

Children of the Universe; The Tale of Our Existence

A German scientific journalist explores how we and our planet are made of the same raw material as the stars and the implications for intelligent life lurking in the universe.

1972 **Im Anfang war der Wasserstoff**

(In the beginning was hydrogen)

The book begins with a focus on evolution as a biological means for the creation of life in its present form. The author goes on to expand his treatment of evolution the creation of the cosmos and to speculate beyond our present knowledge of the universe.

1976 **Der Geist fiel nicht vom Himmel**

(The mind did not come out of the blue skies)

Der Geist fiel nicht vom Himmel : d. Evolution unseres Bewusstseins

1981 **Wir sind nicht nur von dieser Welt**

(We are not only of this world)

The Origins of Life : Evolution As Creation

1985 **So labt uns denn ein Apfelbäumchen pflanzen**

(And now, let's plant a little apple tree)

So lasst uns denn ein Apfelbaeumchen pflanzen

1987 **Unbegreifliche Realität**

(Incredible reality)

1989 **Innenansichten eines Artgenossen**

(A same type man's insight view – Reflections by a Member of the Species – his autobiography)

Unpublished works

1992 **Das Erbe des Neandertalers**

(Neanderthal man's heritage)

1994 **Die Sterne leuchten, auch wenn wir sie nicht sehen**

(Stars shine even if we don't see them)

1995 Die Wirklichkeit des Homo sapiens

(The reality of the homo sapiens)

Other works available through amazon. Com

- Neue Horizonte 92/93 : ein Forum der Naturwissenschaften: als Mannhelmer Forum begréundet von Holmar V. Ditfurth

  By Hoimar von Ditfurth

- Innenansichten eines Artgenossen : meine Bilanz

  By Hoimar von Ditfurth

- Die Sterne Leuchten, auch wenn wir sie nicht sehen : éuber Wissenschaft, Politik und Religion

  By Hoimar von Ditfurth

- Dimensionen des Lebens : Reportagen aus der Naturwissenschaft : nach der Fernsehreihe "Querschnitt"

  By Hoimar von Ditfurth

- Wir sind nicht nur von dieser Welt : Naturwissenschaft, Religion und die Zukunft des Menschen

  By Hoimar von Ditfurth

1990 Das Gespräch

(The conversation)

Das Gespréach

The transcript of an interview with Hoimar von Ditfurth conducted by Dieter Zilligen. A great summary of HvD's theories and main reflections.

- **Science and Religious faith are not mutually exclusive.**
- **"I would be interested to know what God is actually thought when he created the world."**

…Hoimar Von Ditfurth

Kalinga Laureate for Popularization of Science – 1979

Dr. Sergey Petrovich Kapitza, USSR

[Born: 14th February, 1928, Cambridge, England...]

"The authority of Science is based on the Power of the Scientific methods and resides in Proof by experiment rather than by Pronouncements of the learned or the vote of the people".

...Sergey Kapitza

Sergey P. Kapitza

A Biographical Profile

Professor Sergey P. Kapitza, Ph.D, D.Sc., was born in Cambridge, UK in 1928. He graduated at he Moscow Aeronautical Institute in 1949 and has orked in Aerodynamics, Geophysics, Electrodynamics, Theoretical and Nuclear Physics, History of Science and Education. Since 1956, he is at the P.L. Kapitza Institute for Physical Problems in Moscow of the Russian Academy of Sciences. As full professor of Physics, he was teaching at the Moscow Institute for Physics and Technology.

An author of six books Kapitza since 1973 moderated the main TV program on Science and Society and has numerous publications on matters of Science Policy. He has won the State Prize, Russian Government Prize, for studies in Population Dynamics, The UNESCO Kalinga Prize, and the Oppenheimer Medal. Member of Club of Rome, at present is President of the Euroasian Physical Society . Member of Academia Europaea, World Academy of Arts and Science, Manchester Literary and Philosophical Society, International Astronautical Academy, Russian Academy of Natural Sciences etc. Married to Tatiana Damir, he has three children and four grandchildren.

Sergey Petrovich Kapitza was born on 14 February 1928 in Cambridge, England.

As a contribution to electrodynamics Sergey Petrovich developed the theory of Cherenkov radiation in a scattering media. By and under the Kapitza's guidance much work was done on applied electrodynamics – from the design of magnets, microwave measurements, electrodynamics of open resonators and, finally, the development of the oroton- a versatile tunable submillimeter generator, that has now evolved into a subject of its own.

Since 1956 Sergey Petrovich has taught on a part time basis at the Moscow Institute for Physics and Technology and in 1965 became full professor there. For 33 years he was in charge of the Chair of physics, responsible up to 1998 for teaching general physics for the first three years.

In 1973 Kapitza published << The Life of Science>> - a collection of more than a 100 forewords and introductions to major works of science, since Copernicus and Darwin up to the present. It provided the background for a serial TV <<The obvious yet incredible>> broadcast on the main channels in the Soviet Union since 1973. Running now for 26 years and discussing matters of science and society, these talks conceived and moderated by Sergey Petrovich, became a landmark in science broadcasting, were recognized by the State Prize in 1980, the Kalinga Prize of UNESCO in 1981, the Prize of the Russian Academy of Science for popularizing science in 1995 and a number of other awards. Matters of science and society led Kapitza to join the Pugwash conferences on science and world affairs and later he was invited to become a member of the Club of Rome. Sergey Petrovich was engaged in debates on global security , the manace of nuclear war, SDI and <<Star wars>> . He testified at a US Senate hearing and, with Carl Sagan, spoke to the Ambassadors of the UN on nuclear war, gave the Oppenheimer memorial lecture at Los Alamos and twice gave a Friday discourse at the Royal

Institution in London, on accelerators and on SDI. As former member of the national committee on UNESCO, Sergey Petrovich has a long standing association with that international organization, being a member of the World Commission on culture and development and collaborated in the <<Agenda-21>> report with ICSU. In 1999 he was an invited speaker at the World Conference on Science in Budapest, reporting on anti-science trends in the modern world. At present S.P. Kapitza is a member of the Council on Culture and Arts for the President of Russia. For many years S.P. Kapitza was associated with the European physical society, finally becoming Vice-president in 1977-1982. In 1982 he became the editor of the Russian version of <<Scientific American>>, but in 1993 due to the collapse of science publishing, it ceased to be produced.

An Internationally known scientist, Kapitza has been elected to the Academia Europaea, the World academy of arts and science, Manchester literary and philosophical society, International academy of humanism and other bodies. With the founding of the Russian academy of natural science he became its Honorary Vice-president and is now the President of the Euro-Asian Physical Society. Recognizing his early work on aerodynamics Sergey Petrovich was elected to the International Aeronautical Federation and in 1991 was invited to give a plenary lecture at the Annual meeting of the Federation. Global problems were suggested and since then Prof. Kapitza became engaged in developing a model of world population growth, that is now his main subject of research and has led to major contributions to global problematique.

Sergey Petrovich married Tatiana Damir in 1949 and they have three children and four grandchildren.

Places of work at present:

Professor Sergey Kapitza now works at the Institute for Physical Problems founded by his father Peter L. Kapitza (the Nobel Prize Winner, 1978 – for discovering superfluidity and developing modern technology for producing liquid oxygen, laying the foundations for a huge industry). Sergey Petrovich is also the moderator of the weekly TV-program <<The obvious yet incredible>> (Ochevidnoe-neveroyatnoe). Since 2002 the renewal of the publishing of scientific-and-informational Magazine “V Mire Nauki” has begun, S.P. Kapitza is the Editor-in-Chief of this edition and Vice-Rector (Science) of Russian New University (Non-State Higher Educational Insitution).

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❑

ISSUES IN THE POPULARIZATION OF SCIENCE
by
Sergei P. Kapitza

Sergei Kapitza is the most widely known popularizer of science in the USSR. A physicist by training, he was appointed to the Chair of Physics at the Moscow Physicotechnical Institute in 1965 and is in charge of a laboratory of applied electrodynamics and accelerator development at the Institute of Physics Problems.

In 1973 he published his first major book in the field of science popularization, The Life of Science, before being invited by the Soviet TV to conduct a regular science programme on its Channel One. This programme, "Seeing is believing," has an estimated audience of up to 40 million viewers and has also spawned a great number of one-off programmes on specific science subjects. Professor Kapitza writes and speaks widely on science and science-related issues and is a member of the Pugwash Movement, the World Academy of Arts and Science and the Club of Rome. In recognition of his work on the popularization of science, he was awarded the 1979 Kalinga Prize by Unesco. He may be contacted at the following address: Institute for Physical Problems, Academy of Sciences of the USSR, U1. Kosygina, 2, 117334 Moscow, USSR.

Science popularization is playing an increasingly important role in the evaluation of new scientific and technological developments, and in their social consequences, The latest communication techniques offer the possibility of new approaches to popularization, including the use of international televised debates on science-related issues.

What are the objectives, problems and difficulties involved in the popularization of science?

Its meaning follows from the position of science in the modern world. On the one hand, science – and in particular the natural sciences – is closely bound up with society's productive forces, in other worlds with modern economic development. This is obvious in the industrialized countries, where the so-called high-technology industries are rapidly gaining ground. But it is also true of the developing countries, whose progress along the path lying ahead also depends on the advances of science for new departures. In this case the emphasis is on the immediate benefit to be gained from science or from the level of scientific development, which leads to a tendency to evaluate modern science in exclusively pragmatic terms, from the standpoint of its utility.

The assimilation of science into culture has been a slow and difficult process. Indeed a century ago it would have been possible to ingnore it altogether –or to mention it only in order to then dismiss it. Today, however, the process is clearly discernible to all, and science, especially basic science, is now an extremely important constituent of our modern culture in the broad and the traditional senses of the term. This raises a number of questions both in the arts – among philosophers, historians, musicians, artists and writers-concerning their contacts with science and their perception of

scientists' views, and also among scientists and engineers themselves. They are confronted to an increasing extent with the age-old question of values governing society and the proper place of science in society and in the culture that it is penetrating with such inevitability.

The question of the scientist's responsibility, motives and moral code is being posed with increasing urgency, and with good reason . Failure to face these questions would lead not only to the moral degeneration of science and scientists themselves but also to the development of 'scientistic' approaches, the loss of humanist sensibility and ultimately the domination of technology and of 'technocracy' with all the far-reaching social consequences that this would bring in its wake.

Scientific views of the world and of ourselves have wide ideological implications. Modern culture is closely bound up with the scientific image of the world gradually pieced together by the scientists of many countries over the centuries. Today we can speak of a general level of knowledge and of the state of world science. Our present degree of understanding of the basic laws of nature through pioneering discoveries in astronomy, physics, chemistry, biology, mathematics and other fields have become the common property of humankind. There are now no secrets save those kept by Nature herself. Contributions to this rich store of knowledge have been made by scientists belonging to different countries, peoples and intellectual traditions and drawing on various cultural heritages. And one of the issues involved in the popularization of science is connected with this last point.

Even if we acknowledge the existence of a common scientific heritage, the means of translating it into practice depends to a large extent on where and for whom this system of ideas is working. Distinctive features are discernible first and foremost in the educational system. This service exists in every country and has long been operating within national boundaries on the basis of the linguistic and cultural traditions of individual countries. The organizers and peoples, but it is generally acknowledged that education cannot be imported. Although the latest educational equipment may be purchased abroad and invitations may be issued to teachers from other countries, the educational system remains very much a part of the national culture. However intensively it exploits other countries' experience, the education system must evolve along its own lines, otherwise it will be out of touch with social and economic realities and be unable to fulfil its real mission.

This is true to some extent of the popularization of science. The kind of information used in the popularization of science usually concerns particular scientific events or discoveries, say of new particles or comets, species of animals or chemical compounds. These are specific developments of constant interest. But it is much more important to supplement such information, which will always be rather fragmentary and unsystematic, with explanations. A new elementary particle may fill a long empty slot in the system of particle classification and a new discovery may call for a re-examination of established views and lead to a broadening for our scientific horizons. A chemical compund synthesized by new means may lead to technological progress or provide us with a material whose properties have hitherto been difficult to obtain. One example of this occurred when abstract research on the thermodynamics of carbon led to the discovery of a way of making diamonds. People have been fascinated from earliest times by the unusual mechanical and optical properties of diamonds, and large diamonds still excite our imagination. But it is more important to explain what the discovery of new methods of producing or processing them can mean, and what we stand to gain from such knowledge. In the same way, we are at present witnessing the extremely rapid development of research into the applications of superconductivity, once regarded as a rather abstract physical phenomenon, and which now, thanks to the discovery of compounds with high transition temperatures, holds out great promise for practical application in electrical engineering.

The ability to determine the significance of a new development is of great importance and it is what people really want to know about. But in many cases it is about as difficult as predicting the future of a new-born child. Parents always regard their own child as exceptional, and scientists are always understandably biased in assessing the significance of their work. In fact, in many cases they chose their field of research precisely because they believed it to be the most promising, and they certainly cannot be criticized for doing so.

Thus, any description of a particular new invention immediately raises the question of its evaluation. Experienced journalists and editors of popular scientific journals will develop their own views on the significance of particular achievement. Of course, it is easier to do this when the work has been carried out in a well-known laboratory with a solid reputation in the field, and obviously merits careful attention. Some people consider that the main thing is to be able to make complicated material intelligible, to produce an entertaining article or television programme. But this is only part of the story. It should be borne in mind that such considerations concern the professional skills of the popularizers, be they journalists or scientists. In our view, the main thing is to be able to evaluate a particular discovery and put this evaluation across. If this is not done the public is left with a miscellany of perhaps true but basically superfluous and meaningless facts and figures that only serve to fill up space in the mind and the media. If the assessments are inaccurate, even greater harm is done, since the resulting sensationalism directly undermines the interests of both science and society, creating a kind of vanity fair where science has its own roundabout.

Basic attitudes are more important than anything else in science, just as in life. We must cultivate a particular attitude to scientific events and science itself. Indeed, this may be considered as a basic prerequisite for the popularization of science.

Solid practical knowledge and skills can only be acquired through systematic education and training and, as experience has shown from generation to generation, sheer hard work. The popularization of science will never make this kind of work unnecessary but it can and should reveal the kind of world we are living in, the general problems confronting it, the purposes for which knowledge has to be acquired and the values to be applied in the analysis of problems.

In the past, when the volume of practical knowledge was smaller and the content of education was less specific, information did not stifle erudition, and educated individual, in the course of school or university training, was able to master a range of general ideas and draw conclusions that may have been lacking in depth but involved a wide range of concepts. Nowadays, precisely on account of the generally pursued pragmatic approach to education, it is essential to develop a set of ideas of the kind that became the basis of a civilized person's cultural background in the past. One may reasonably expect this to be accomplished at least partly through the popularization of science.

Popular Scientific Journals :

In many countries popular journals on science are published, usually monthly. One such is Nauka i Zhizn ('Science and life') in the USSR, which has a circulation of 3.5 million and has become the kind of publication that fosters a wide interest in science. It is rightly regarded as a family journal, catering for a very wide variety of readers-schoolchildren and students, engineers and doctors, labourers and truck-drivers, country and city dwellers. They are all interested not only in the latest development (which goes without saying) but also and above all in their significance. In 1980 the Academy of Sciences of the USSR launched another journal, the monthly Nauka n SSSR ('Science in the USSR'), in Russian, English, Spanish and German.

Alongside general journals that have clear links with a particular country and language, there is a growing demand for a less diversified popularizing media, especially catering for scientists specializing in other fields. Naturally, the level is

correspondingly higher and the range narrower. An example of this type of journal in the USSR is Priroda ('Nature'), which the Academy of Sciences has been publishing for over 75 years, meant for a relatively highly educated readership, for instance specialists wanting information on disciplines other than their own, postgraduate or undergraduate students, teachers or engineers. Journals of this kind exist in many countries and they are far more easily transferable from on cultural environment to another. For example, Priroda has a wide circulation in the CMEA countries and La Recherche in French –speaking countries. In the last decades the Soviet Union has produced a whole range of popular scientific journals under dozens of different titles, catering for all the various interests and levels of specialization of their readers.

Lastly, there is one journal that is associated above all with the dissemination of world science and which owes its existence to this worldwide cultural phenomenon. We refer to Scientific American which now appears not only in English but also in French, German, Italian, Spanish, Russian, Japanese, Chinese. Arabic and Hungarian. It may be noted that the journal retains its 'American' title only in the English language version, having inherited if from the original publication that first appeared in 1845 as one of the first popular scientific newsletters in the USA.

Scientists and Journalists :

A further question that arises concerning the popularization of science is who should be responsible for it. There are journalists with scientific knowledge and scientists who write well, who are familiar with other media such as television and who are well versed in techniques of film-making on scientific subjects. Examples may be drawn from the list of winners of the international Kalinga Prize which has been awarded annually by Unesco over the last 30 years.

Can special training courses be provided for science journalists? Yes, but it is definitely easier to teach a science graduate to write well than to teach a skilled journalist science. Various courses and schools offering short-and longer-term forms of retraining and further training for specialists can probably play a major role in educating popularizers of science. Unesco could probably do a great deal in this area, particularly by making the experience of countries with a developed system of scientific journalism accessible to regions with a particularly pressing need for this type of activity.

In addition to the authors themselves, be they scientists or journalists, a great deal of responsibility lies with editors, who set the level and determine the approach, the style and frequently the general slant of what is seen, heard and read. These people are less likely to be scientists. Instead, they tend to rely on the author for the facts, while considering themselves more competent to gauge the interests of their readers. Unfortunately, what is sometimes written about science or shown in the cinema and on television makes one wonder whether this confidence is justified. However, it is not so easy to reconcile the natural demand for reliable, accurate and understandable scientific facts with the public's justified demand for material that is accessible, comprehensible and entertaining. Unfortunately, nobody has yet found a recipe for success in this area either.

Exhibitions and Museums :

Museums and exhibitions have long been used to propagate scientific ideas and achievements. This is an area which it is worth considering separately, since activity has recently been intensified as a result of the growing importance of disseminating scientific knowledge.For example, the Academy of Sciences of the USSR organizes over 50 exhibitions a year on Soviet science in various countries. In 1986 the scientific center at Tsukuba near Tokyo hosted what was essentially the first world exhibition, 'Science 86'.

Wide-ranging action is being taken to develop science and technology museums, which as a result tend to be modern centres for the popularization of science and technology rather than historical museums. These centres cater

primarily for young people and are designed to help them in defining their attitude to science and technology in the modern world. Special mention should be made of the Cité des sciences et de l' industrie (La Villette) in Paris as an outstanding example of this kind of venture carried out in a grand, national style.

Science-related Social Problems :

Current development in science have given rise to another set of problems, namely science-related social problems. The importance of these issues stems from the social significance of science and they have long been of major concern to the reading and thinking public. In the past, for example, the development of astronomy and evolutionary biology led to a bitter conflict with religious teachings concerning the formation and development of the organic and inorganic world. The same thing happens today when we examine the impact of micro-electronics and computer science on our daily lives. These issues are particularly controversial, even giving rise to outright conflict in education. The educational system, especially in the schools, is inevitably somewhat conservative. Major new ideas and concepts are likely to have particularly momentous implications for schools and it is here that they encounter the greatest resistance.

The history of science has an important part to play in popularization. It is well known that modern scientific education pays practically no attention whatsoever to the past. The great names of the past are there like shadows attached to the ideas, laws and phenomena with which they are associated. The fact that the history of people and ideas is ignored in the modern educational process is largely responsible for much of the dehumanization of the natural sciences and their severance from their human origins. The popularization of science can and should make up for this deficiency: hence the growing importance of memoirs and biographies of scientists and of science and technology museums. The history of science has yet another dimension – its concern with the future. Unless we examine the past, we cannot hope to predict the future. It is a paradox that writers have been more successful than scientists in forecasting the social problems likely to accompany scientific progress. Modern writers such as H.G. Wells, Aldous Huxley, Zamiatin and Alexi Tolstoy were actually more aware of social trends and were thus able to evoke a more representative picture of the future than the majority of scientists who tried to foresee the shape of things to come. Perhaps this takes us beyond the popularization of science into the realm of literature, where links with reality are deliberately severed in order to escape into an imaginary world of fiction.

Modern science is also experiencing difficulties in developing and describing complex interdisciplinary research. To a large extent this is due to the rather rigid division of science into separate disciplines, which fail to reflect the persistent human need for an all-embracing view of the world. This is particularly striking in the case of our relationship with the environment. The development of ecology has made it necessary to adopt a new synoptic approach to the question of our place and purpose in the world. The dissemination of these ideas during the past few years has been of growing significance, clearly illustrating the social importance of the popularization of science.

Of the various science-related social issues, one is particularly vital at the moment and that is the series of problems associated with science and the arms race. Arguably this is the most important scientific-social question of our time, and serves to demonstrate with exceptional clarity the complicated nature of the problems confronting us today. It is no coincidence that scientists are tending to play a prominent part in the international debate on this subject. They frequently appear as the propagators of the scientific approach to these issues and the popularizing media themselves become involved in important political discussions. The debate on the 'nuclear winter' and the Strategic Defense Initiative ('Star Wars') may

be mentioned by way of example.

Similar questions arise in the discussion of science-related social issues in the developing countries, where the promotion of social awareness is a key aspect of the development process.

The Role of the Mass Media :

The mass media, especially television, have a special role to play in the whole area of popularization, and above all in relation to the world problems referred to above. They have become an extremely important means of communication and of influencing public opinion. At the same time, their potential impact can be a source of problems and difficulties, and the responsibility of the mass media, especially the electronic media, is remarkably great.

In some cases-and this is typical of countries with a developed system of non commercial television – the popularization of science has gradually gained a firm foothold. In such countries, which include the United Kingdom and the USSR, the tradition, experience and creative potential of the popular scientific film industry is well established, and with the advent of television was well prepared for the popularization of science and hence for the discussion of science-related social issues. In countries where commercial television predominates, a different pattern has emerged for popular science progammes. It is unfortunate that in such cases legislators and State institutions have no direct influence on such a vital issue as the formation of their citizens' attitude to what may be the most important factor in a country's progress, namely science. Some hope may be placed in the development of cable television, but it remains to be seen what kind of interests are to direct its programming policy.

In the USSR the programme Ochevidnoe-Neveroyatroe ('Seeing is believing') has been running for over 15 years on the first general television channel. Together with the TV news programme Nauka i Zhizn, it is probably the chief medium both for the popularization of science and for the discussion of major science-related issues.

Our experience has shown that the key to success is the level of expertise of the participants whose views and comments are broadcast. It is not with a view to exhausting the depths of science that a high level of expertise is required but primarily because only eminent scientists are capable of evaluating the subject-matter and helping to form a reasoned attitude to the issues being discussed, for instance the pollution of the environment by industry, ethical problems in modern medicine and genetics or matters relating to science and the arms race.

The question of responsibility is particularly important in the case of a scientist appearing on television . The television screen has certain magical powers of persuasion that cannot be disregarded. This is particularly true in the case of those personalities who are constantly on television. How are they to handle their 'electronic authority"? Besides, in what capacity are they speaking: their own personal capacity or that of the scientific community, their own field of specialization or the narrow circle to which they belong by virtue of their education and work? Perhaps great scientists on television represent the phenomenon of worldwide science referred to at the beginning of this article. World science certainly exists. Indeed there are scientists with a worldwide reputation, although it is difficult to imagine that they actually personify world science. Questions of this nature are unavoidable if we seek to understand more clearly the ways in which public awareness is shaped by the mass media.

Sometimes the most effective approach seems to be that of a debate, the confrontation of ideas. The didactic power of debate is well known and is certainly a way of getting at the truth. But however paradoxical it may seems, it is rather naive to present issues that are often of a scientific nature to viewers and expect them to reach their own conclusions. For example, the parties may be discussing the merits of the open or closed model of the Universe, a question to which the answer is

yet unknown, or viewers may witness a debate between an astronomer and an astrologer in which science crosses swords with a deeply entrenched superstition. What will be the outcome of the confrontation? The astrologer is likely to win, since the power of persuasion and eloquence plays a greater role in astrology than in astronomy. The fact that science came out on top in the historic debate between the biologist Huxley and Bishop Wilberforce has more to do with the brilliant style of the famous popularizer of Darwinism than with the cogency of the arguments he advanced. But in the case of science-related social problems, in which the human involvement of the parties is so important and value criteria play such a major part, the opposing sides in the debate and the audience are on equal terms and discussion is a particularly appropriate method of presentation.

Global Problems :

Science-related social issues account for a large proportion of current world problems. We are only just learning to formulate and discuss these problems, although the development of attitudes and the promotion of public awareness of their existence is one of the major challenges of our time. We cannot hide our heads in the sand like the ostrich and avoid these questions indefinitely. In this context, the popularization of science is of such importance that we shall probably need a new concept, a different frame of reference for propagating ideas and influencing society than that used in the past.

It is now generally agreed that certain world issues are going to become acute in the foreseeable future, for example problems of energy, the environment, natural resources, demography and, last but not least, the problem of the arms race.

Top priority must be given to research on these complex issues. The first steps towards a worldwide effort of reflection are discernible in the work of the Club of Rome, the International Institute of Applied Systems Analysis, the World Resources Institute, the Institute of Life and other national and international organizations. As a result of the interdisciplinary approach to these problems and international co-operation among scientists, a new research methodology is being developed and interesting results have been achieved, although it would be premature to expect any conclusive answers to these problems at this stage. Nevertheless, the time has come to launch a wide public awareness campaign. We must help to form and inform public opinion, developing new perceptions and a new understanding of these problems.

Even such relatively simple questions as the causes and consequences of the accumulation of carbon dioxide in the atmosphere have not yet been solved, and for this reason they have been given high priority in the international 'Global Change' research programme on changes in the biosphere and geosphere to be undertaken by scientists under the auspices of ICSU over the next ten years. This programme will undoubtedly shed light on a number of global issues. Other questions relating to population, economic problems, health, education and culture are being studied under the international programmes of Unesco and the World Health Organization (WHO).

The Message of Science and Television :

It has become essential, in the context of international co-operation, for scientists and television systems around the world to combine their forces in a debate on global problems. Highly qualified specialists from leading research centres should take part in this project and their discussions should be illustrated by accompanying visual material.

We have already had some experience of television debates on such topics. One of the first television links-ups between Moscow and Washington in 1983 discussed the worldwide consequences of a nuclear war, and the problem of the 'nuclear winter'. In 1984 there was a Moscow-Boston link-up on scientific co-operation, and in 1985 a Copenhagen-Boston-Moscow link-up on the occasion of the centenary of the birth of Niels

Bohr discussed the question of an 'open world'. Another interesting experiment was the satellite link-up on Chernobyl and the nuclear power station on Three Mile Island, in which scientists from Moscow, Washington and five other cities in the USA and the USSR took part. The debate focused on energy problems of the future rather than accidents in nuclear power stations *per se.*

A further notable event was the television link-up *Together to Mars?* between Moscow and Boulder, Colorado, in the summer of 1987 . Over 50 scientists and engineers divided into three interactive groups of experts took part in the 3 ½ hour debate on general, scientific and technological aspects of research on the planent Mars. The leaders of the discussion were Carl Sagan and the author. This link-up aroused a great deal of interest and a recorded version was shown in October 1987 on the occasion of the thirtieth anniversary of the launching of the first man-made satellite.

Experience with link-ups has shown, however, that direct interaction between participants far better than satellite or electronic links, in spite of all the symbolism of contact through space. It seems clear that experts need to be brought together in one particular place to discuss and broadcast a common message on complex interdisciplinary problems.

A possible solution would be to organize international discussions as follows: the participants-five to six scientists and experts-would come together with a moderator: they would be given two or three days to prepare for the recording of the discussion; they would then all come together in the studio for a 2 –2 ½ hour recording session, during which a representative audience of interested listeners could participate either in the studio itself or via cable or satellite. These groups could take part in the discussion through the local moderator, asking questions and offering illustrative examples.

The programme produced in this way could either be broadcast live or recorded and edited for subsequent transmission. In the latter case, it is, of course, easier to take account of the demands of the specific audience and language for which the edited version is intended.

This type of discussion, on which I have dwelt at somewhat greater length, may serve as the basis for the organization of international discussions on the really complex problems facing humanity. We must seek new, varied and effective ways of discussing these matters. It is ever more important is to communicate our conclusions to all nations, the UN, governments and the general public. This will demand not just an occasional effort or a series of programmes but, rather, systematic collaboration over an extended period of time. We must influence people's basic attitudes on these issues, assisting each and every one to find new values and new forms of participating in, and responsibility for, our common destiny, the destiny of all on our planet. In this sense, special responsibility lies with scientists, disseminators and popularizers of science and those who determine the objectives and policy principles of the media and of education systems.

The technology for an effective global communication and information service already exists in the modern world. We must find the means and capacity to direct it towards solving world problems. Millions of people are willing to follow the fortunes of the ball in a game of soccer or tennis match. Could we possibly be less concerned about the fate of the globe we all inhabit, and which is our only possible home for the foreseeable future?

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Kalinga Laureate for Popularization of Science - 1980

Mr. Aristides Bastidas, Venezuela

[Born : 12th March, 1924
Died : 23rd September, 1992]

"Science and the Technology have the same origin that the poetry and the art."

...Aristides Bastidas

Aristides Bastidas
A Brief Profile

He was born on 12th of March, 1924 in San Pablo, Yaracuy State, cradle of illustrious men. He was a Reporter, journalist and scientific investigator, Prodigious self-taught person who without to have attended superior education, was honorary professor of several universities and on their figure have made doctoral thesis and other studies and have published biographies. Writer of: The Atom and its Privacies, Scientists of the World, Quiet Allies of the Progress, The Constant Yearning, The Organs of the Human Body, Pleasant Science, etc. The Latin American Association of Scientific Journalism was founded be him in 1969. He gained twice the National Prize of Journalism, The Latin American Prize of Scientific Journalism "John Reitermeyer", several times the Municipal Prize. He was also the Winner of the prestigious Kalinga contest, granted by UNESCO, considered as the Nobel Prize of the scientific spreading, received among others by Julian Huxley, Bertrand Russell and Augusto Pi Suñer. Hours before his death, on 23rd September 1992, he got to know that he had been awarded by the University of Florence with the "Capire," International Prize for a Creative Future.

Aristides Bastidas Born in St. Paul, the current state of Yaracuy, Venezuela, March 12, 1924 and died in Caracas on September 23, 1992. He was among several things journalist, educator and populariser of science.

Born in St. Paul, in the state of Yaracuy, Venezuela, March 12, 1924 was the son of Nemesio Bastidas and Castorila Gámez. He moved to Caracas with his family in 1936, radicándose in a modest neighborhood in the south of the capital. He studied first year of high school at the Lycée Fermin Toro, studies not completed because the economic compulsion family forced him to perform various trades until 1945, when he began in print journalism. As a trade unionist and gremialista was part of the resistance against the regime of Marcos Perez Jimenez (1948-1958). In self-training he pioneered journalism in modern scientific information, interpretation and opinion, on gender print and radio.

For his contribution to the development of scientific journalism he received recognition from the governments of Venezuela and Spain, and the Organization of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which awarded him the Kalinga Prize-1980 (Paris, 1982). The Andres Bello Catholic University opened in 1991 the chair of scientific journalism that bears his name. Today his home town is the capital of the Municipality Aristides Bastidas, in honor of very worthy man.

Among his books is *The yearning constant 1982.*

He died in Caracas, Capital of Venezuela, on September 23, 1992.

Consuelo Hernandez. "The constant yearing, a book for everyone." El Nacional. March 8, 1982.

Thoughts of Bastidas :

Some thoughts of Aristides Bastidas are:

- "If I were given a wish, express the work until the last minute of my life."
- "Our democracy has become a way to enjoy many rights and failing to comply with any duty."
- "The motion of us, journalists, it is not the dark waters to look deeper, using a language unintelligible, it is quite the opposite, to bring clarity where there is confusion and call things by the name with which the know people."
- "We need to extinguish this absurd notion in which a bojote ticket worth more than a man."
- "Science and technology have the same source that poetry and art."

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Acceptance Speech of Aristides Bastidas while receiving UNESCO Kalinga Prize

I must be thankful in a form deeply affected the words that about this worker of the media Mr. General Director of UNESCO with a very noble generosity has said. I must be thankful to UNESCO to Kalinga Foundation and to all you this highest distinction that at the moment for receiving I felt it that it was as important as the day of my birth or like the day in which my children were born. Very many thanks. I must at the moment show also my gratitude by the Newspaper "the National" of Caracas, spokesman of the thought and the culture in Latin America, that has made me the honor welcome my writings for more than thirty years in which with my efforts of constant work I have wanted to show the deep love which I feel by the humanity.

In our country we have been making a journalism scientific, in which we tried to take messages with which it is contributed to dissipate the ignorance of our third-world towns and the vocations of the children are fomented and of the young people, by science and a public conscience in all the levels is seeded about the determining paper that the advance of the knowledge carries out in the fight to reach the tops of a social and humanized development. Our scientific journalism of course takes care of the principles of the spreading, that is to say, that without decline of the seriousness of the message to our position we used licenses of the media, like the one to use the language of the town to express the things that the scientists speak in the codified language of their laboratories. We despised neither the images nor the metaphors nor the air smiling that there is in the language which to the men of the town and the simple men speak because we are to as much that no language speaks with the precision and the pedagogical clarity that that one, of which we are worth to expose of an accessible way the complex things the more of the scientific thought.

Science in daily language, there am a good there that few do. Of equal way, our humanist Cecilio Acosta it expressed that what interests to us is not the light that is concentrated, but the light that spreads. And you already know who our universal thinker Beautiful Andrés to who a year ago they paid a beautiful tribute in this huge institution, he was a publishing one of the science that requested that it had her national stamp, so that each nation contributed the individual tribute to him in order to engrandecer it like the greatest patrimony of all the men.

We, by our part, have said that the science must be how the light of the sun, that leaves for all. In short, we have tried to apply the techniques by means of which the communication can arrive at all the cultural levels, but this of course not only has both assignments of which before it speaks to them: it also has the assignment to fight against the main hindrance that at the moment confronts the third-world countries in their fights to reach a social and humanized development. I talk about the technological dependency, that is at the moment the line that defines the character of the tercermundismo to our way to see, because the technological dependency that creates economic dependency also creates cultural dependency and creates political dependency. And this trilogy of burdens is permanently deepening the social crises that our towns live and the limitations greater than every time must confront with the intention of jumping towards valleys of the promission, to which also have right.

Reflecting about this unjust distribution of the knowledge, we have thought that time will have in that the wisdom is distributed equitably between all the components of the human population, between

all the nations, so that all can enjoy their advantages, their enchantments, and the happiness that it can provide, because the wisdom was not accumulated during many centuries not by certain nations nor by determined either individual, but by the humanity, for or of her children in all the generations that there are to come. Nevertheless, something walks bad in the moral of the man. Often we thought that that moral walks bad, because it remains in the cradle and it has not managed to be developed well, so that instead of the present presagiosas attitudes of certain powers, we had like hope a full perspective horizon to gratificar us the work with the happiness and the happiness that to him to many needs of our third-world towns, in spite of the fecund action of the intensive work that frees constantly with the intention of getting away of the fastenings that they are put under on the part of the metropolis. We considered, then, which the scientific media, that policy of any type does not have, but that has its own policy, it must find in this fight against technological dependency one of his more total justifications. What is requried is the determination of UNESCO to create a new order in the information for the world. At this point in which we were on the eve of the century XXI, and in which the levels of the human culture have been increased sufficiently, as important public service cannot be explained that as he is the one of the social mass media, that are called to affect the forge of the presents and of the future generations, which they are called to fulfill a fundamental roll in the education of the towns, it is not possible to be conceived that those means are into the hands of people that with them does not look for but pure mercantile purposes, pure egoistic dividends, pure forms to thicken their opulent wealth. This requires because yes an observation of bottom and a substantial modification, because the freedom of press, the freedom of thought and the freedom of information to justify the frequency whereupon in the most excellent spaces of the press cannot be invoked, the radio, the television and the cinema disclose the thinks that express the human misfortune, the robberies, the cinema disclose the things that express the human misfortune, the robberies, the estupros, the crimes and the violations, while the facts of the great thinkers like the meaning of them like señeros examples are placed secondly as much of which it must be the man. This prevalencía of the transitory thing and the grotesco over the nobleman and the elevated thing, that is the man, has made me often think that the media, that the mass media, are in a paleolítico; and that will arrive some moment from history from humanity, in which 10s journalists will be shamed of which there had been a time, in that occurred reference to the most monstrous things of the human being in name of the sensationalism and name of the freedom of commerce.

I think that it is hour that there is one more a nobler conception, more hidalga and higher of which it is the task of science. It is not possible that it is being used to science with the intention of making the most monstrous warlike devices and that at the present time the powers have apparatuses with sufficient energy, to destroy this planet and some others of the Solar System, while we must complain the shortage of energy for the good things of the existence humana.La to us science it must be reoriented and it is necessary to impose a moral to him, because she lacks in if moral and is necessary to impose it to it from outside. It is necessary that science is edged with the humanistic characters of which must be accompanied, in order that the dealers of the war and the destruction do not continue it using for their ominous aims. This must worry to us and this is an old vice of the man, this to use something so noble and so elevated as it is the knowledge for the aims of the ruindad and the corruption, for the most opposite things of those than they are locked up in the heart of the men. Or at the time of Archimedes its talent for warlike aims was used and including a

humanist of the high condition of Leonardo it was lent to make tanks in order to multiply the warlike possibilities of the princes of Florence and in our time, or we know the sadness of Albert Einstein when it knew that the atomic pump had been thrown on Hiroshima and Nakasaki and we also know, that there have been men like Eduardo Teller and Samuel Cohen that with a sinister talent and making use of the knowledge that the humanity adquiri6 during many centuries, used them to make the hydrogen pump and the neutron pump. These facts are also repudiables by the moral of the scientific media and are repudiables also by the conscience of the men who have a sense atom of which he must be justicia. Es necessary that the man yerga over this stupid sense of the indignity and the immorality, with the intention of which he rescues his more intimate values and he puts them to flame like the flags of the hope and the happiness that sooner or later the man is called to conquer.

I want to finalize these words saying to them that the experience of the scientific media that has become in Venezuela is at your service of all our brothers of the Third World and the other nations. And I mean also that to respect not only the science that solves problems immediately, but also the science that serves to enrich the human knowledge, that was the one that mainly was made during many centuries. I mean that to respect deeply those words enrolled in the Ramavana by that great Balmaqui poet, who said that climbing science is an honor higher than the one to reach a throne. I mean, finally, that we are agents of the optimism and who we are permanently working with the confidence of which the science, that is the petroleum of the future, but that has on him the advantage of which it is non average goal and that has on him the advantage of which it is possible to be renewed, while first it is exhausted, I mean that science will serve to us someday to always seed by the smile in the broken face of the contemporary man. Very many thanks.

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Arístides Bastidas: While he surpassed the pain made pleasant to science

by
Joaguin Pereira
ABN 12/03/2006

Caracas, 12 Sea. ABN. – Throughout history men have existed who have made of the adversities the incentive that impelled them towards the success.

Venezuela was the Earth where not only he was born but where he could"be prophet" one of these exceptional beings. His Arístides name,his Bastidas last name, his more characteristics characteristic: the optimism.

In a humble house of the population of San Pablo, Yaracuy state, was born the 12 of March of 1924 who would be recognized national and internationally like one of the best scientific journalists in Spanish language. The key of his success was the translated salary science to the language of the town and it to have made pleasant.

The life would have destined a paradoxical way to him. He would receive all the possible recognitions that they are possible to be given a journalist but also their physical sufferings would be abundant.

"How are you?", said somebody to him when seeing him. "Chévere cambur pintón, parchita, handle, cotoperí, guanábana, melon", responded a Arístides that until in the greeting was generous.

Greeting and smile that would in the last resist with their stamp 20 years of their life, when he was blind, quadriplegic, almost dumb and with serious affections in joints and skin.

" I have developed an inner light that only use to watch the beautiful thoughts and the good intentions", affirmed in an occasion on its blindness.

In spite of his problems of health, that knew he never affirm to have listened that he complained, rather said to be contented because a man with good luck considered himself ".

And if luck can be called to him to be surrounded by beautiful and intelligent women, that was indeed what had Bastidas. In the last 13 years of his life he enjoyed the friendship of Myriam Cupello, that not only was Miss Venezuela but that dedicated his life to the anthropological investigation in the most distant towns of the planet.

Cupello wrote in 1994 a book in tribute to Bastidas, document that added to the interviews, the author and one of the children of the journalist, photographer Pavel Bastidas, would serve as base for this semblanza of the remembered author of the column pleasant science, published daily in the newspaper National from 1971 to his death, the 23 of September of 1992.

Of "loquero" to journalist :

"I have dedicated myself to the media, first by a strange vocation that not yet I reach to understand very well, and later because I included / understood that through the social communication we can penetrate in the intimate roots of our town, in the intimate roots of each man, with the intention of helping it to fortify himself and to help it to enaltecer himself, and to help it to become the creative being, in the responsible being who is going to transform his society", it was the answer that gave Bastidas him to Cupello, when she asked to him in an opportunity because she had been dedicated to the profession.

From very small, Arístides had to work to collaborate with the sustenance of the home. He got to exert of hardware merchant, traveling, distributing salesman of round maize loaves at home, collector of bus, secretary of office and until of "loquero" or assistant of infirmary in a psychiatric hospital.

"Some times he let leave to a crazy person enamored with his woman. He returned tempranito and it brought grapes to me", is one of the anecdotes that Cupello de Bastidas gathers.

Although he only got to study until the first year of baccalaureate, in the Fermín Grammar school Toro of Caracas, Bastidas managed to enter the first group of Last reporters of the Newspaper the News.

"Generation of improvised", as he remembered them, which they learned to make journalism according to the method of Kotepa Delgadof, head of the metropolitan newspaper. This it sent to the novices to the street "since they make the margariteños with the children so that they learn to swim : they send them to the sea without lifeguard".

One began covering the police source, soon it made information general and later he worked looking for the news of the Parliament and national policy. He won for that then around 200 bolivars monthly.

The 24 of November of 1948, when as soon as he began in the office, were called on to him to be present in Miraflores, seat of the Venezulelan Executive authority, during the coup d'etat against president Rómulo Galician, led by Marks Perez Jiménez.

Four journalists were in the site and were encañonados with machine guns: Miguel Knoll Silva, Francisco "the Fat person" Perez, Ramon Medina Villasmil Villa and Arístides Bastidas.

His true vocation, from scientific journalist, would arise in 1953 when the National like successor of journalist France Natera entered the newspaper to follow with the work that he made to write the Entérese column you, along with Miguel Knoll Silva, director of the newspaper.

During the dictatorship of Perez Jiménez those journalists were dismissed of the National who agreed or supported the ideas of the Comunism. Bastidas had the luck of not being expelled to dedicate himself to write on science, although by a prolonged time he was harassed in his work.

"During weeks a person behind schedule came each from the regime and he broke his notes to him in the face. Never he was affected and he continued writing until they realized of which their writings were not dangerious", remembered Myriam Cupello.

Paradoxicalally, the scientific media was born in Venezuela thanks to the dictatorship that allowed to develop subjects different from the policy, source that was censured.

Revolutionary by "coscorrón" :

Arístides Bastidas commented that of some form he began to be revolutionary by "coscorrón" that gave a priest him at his time of monaguillo.

In order to fulfill promise that made his mother when he was born, Arístides had to go away to live a time to the church. He, Bastidas, of Indian origin, and another young person of white complexion helped to the parish priest during the masses.

Thanks to their excellent memory and his fervor easily managed to learn the diverse answers that occur during the religious service, that then was developed in Latin.

Bastidas told that the treatment of the priest was different for both monaguillos, while the target received the best meals, clothes, bed and treatments, from him always touched the worse part to him.

A fact would disappoint the Bastidas young person and happened when he responded in one of the masses of inspired form but in low voice, the priest gave a blow to him in the head not to listen to it well. However to the companion who remained shut up, not to have learned the Latin, it did not do anything to him.

This forced him to move away of the church. Later he was enlisted in the rows of the Comunism, where he saw that truly the doctrine of Jesus practiced : He fought by the equality, the brotherhood and the love to the resemblances.

At the end of his life, Cupello commented, would return in Bastidas its necessity by the religion.

Meawhile, the Communists introduced him to the would of classic music, one of their passions after the media.

His ideas and the torture :

By union and political activities, Bastidas was on two occasions stopped by the call National Security of the dictatorship, once in 1949 and another one in 1950.

In an occasion, their detectors when knowing their suffering reumatismo, wet their cell with water daily to cause, suffering to him. “I left almost totally paralyzed”, told Bastidas him to Cupello.

After being set free they imposed “by jail” the city to him of Barquisimeto, state Lara, that is to say, it could not return by a time to the capital.

In that organization it created corresponsalía of the National and worked there by two years.

His passion : The work :

For the older son of Arístides Bastidas, the work was a vital necessity of his father. “He got passionate to Him what did. It left every day very early in the morning and returned behind scheduled”, remembered Pavel Bastidas.

One of the greater legacies than could leave Arístides Bastidas to the country was seedtime of knowledge and moral in the disciples who attended newspaper to their dear “Brujoteca”, as affectionately they called to his office.

While the pasantes read the information to him of the column of the day, that could turn on mirra, the diabetes or the spermatozoon, the teacher offered his wisdom them in phrases that made transform these young people into men and women jeopardize with their work and the country.

“To enjoy the other people’s success as if outside the mine own one”, was its principle against the dishonest media. “There is no eternal solitude, is necessary to stay ready to give the welcome to the hope”, also said.

All the honors :

The immune man to the pain and the translator from science to the town were recognized while still alive in multiple occasions and his name has been used to indicate from seats and forests to schools and a municipality.

He was the first alive man to whom they named symbol of the Week of the Conservation. Before to him the deceaseds Agustín Codazzi, Francisco Tamayo and Henri Pittier were named already.

Also, Bastidas was named Doctor Honories Cause of the Central University of Venezuela and also received the prize of the Medical Federation.

With 44 years of age, in June of 1958, He received the National Prize of Journalism.

He obtained, on the part of the newspaper the most important National, prizes destined his journalists: the Enrique Vizcarrondo Knoll, in 1956, and the Antonio Arráiz, in 1975.

In 1970 Scientific John Reitemeyer, granted by the Inter-American Society of Prensa received the Latin American Prize (SIP).

The 7 of May of 1982, in the central seat of the United Nations for the Education, Science and the Culture (UNESCO, by its abbreviations in English) in Paris, received the Kalinga Prize, equivalent to Nobel granted for publishing scientists. The decision to choose him was unanimous, of between 68 participants who aspired to the recognition.

In the delivery of the prize, Amadou M’ Bow, chief of a main directorate of UNESCO by then, said that Arístidas Bastidas “has the gift to communicate or to know, in simple terms, to upper render the knowledge of level within reach of each one.

Bastidas not only has fought against the social and economic adversity, but also handicap had to surpass a physical double: his disability and his blindness, thanks to an anger outside the common thing, ally to an exceptional capacity of analysis and synthesis".

The Venezuela of his dreams :

Aside from his love by education, Bastidas was founding of important associations that work in favor of the journalists in Venezuela: the Circle of Scientific Journalism of Venezuela, the National Union of Workers of the Press and the Institute of Social Forecast of the Journalist.

On the country they bothered four things to him: the flat racing, the lotteries, the bureaucracy and the politiqueros.

In spite of this, the journalist got to affirm that the country had great objectives that to reach, like the total exercise of the national sovereignty, the total administration of its natural wealth, total economic independence and the ample development of the industry and the farming production, "elements fundamental to free to us of the interference of foreign interests".

"I conserve total faith in the economic emancipation of my country, that perhaps does not see I to it but I trust that they see my children it", he said in an opportunity.

Aristides Bastidas defines the Philosophical direction of his life in four verses of great poet Antonio Machado :

"Currency that this in the hand
perhaps one is due to keep
and the monedita of the soul
it is lost if one does not occur"

Kalinga Laureate for Popularization of Science – 1981

Sir David Attenborough
United Kingdom

[Born: 8th May, 1926, London, England …]

"It seems to me that natural world is the greatest source of excitement, the greatest source of visual beauty; the greatest source of intellectual interest . It is the greatest source of so much in life that makes life worth living."

… David Attenborough.

David Attenborough : A Biographical Profile

World's Best Known Broadcasters, Humanists and Naturalists

Born	:	May 8, 1926 London, England
Residence	:	Richmond, London
Nationality	:	British
Field	:	Naturalist
Alma mater	:	Clare College, Cambridge (Natural Sciences)
Notable Prizes	:	Order of Merit, Order of the Companions of Honour, Royal Victorian Order, Order of the British Empire, Fellow of the Royal Society

Sir David Frederick Attenborough, OM, CH, CVO, CBE, FRS (born on May 8, 1926 in London, England) is one of the world's best known broadcasters and naturalists. Widely considered one of the pioneers of the nature documentary, his career as the respected face and voice of British natural history programmes has endured more than 50 years. He is best known for writing and presenting the eight "Life" series, in conjunction with the BBC Natural History Unit, which collectively form a comprehensive survey of all terrestrial life. A ninth series is in production. He is also a former senior manager at the BBC, having served as controller of BBC2 and director of programming for BBC Television in the 1960s and 1970s.

He is the younger brother of director and actor Richard Attenborough.

Early life :

Attenborough grew up in College House on the campus of University College, Leicester, where his father, Frederick, was Principal.[1] He was the middle of three sons (his elder brother, Richard, became a director and his younger brother, John, an executive at Alfa Romeo). During World War II his parents also adopted two Jewish refugee girls from Europe.

Attenborough spent his childhood collecting fossils, stones and other natural specimens. He received encouragement in this pursuit at age seven, when a young Jacquetta Hawkes admired his *"museum".* A few years later, one of his adoptive sisters gave him a piece of amber filled with prehistoric creatures; some 50 years later, this amber would be the focus of his programme *The Amber Time Machine.*

Attenborough was educated at Wyggeston Grammar School for Boys in Leicester and then won a scholarship to Clare College, Cambridge where he studied geology and zoology and obtained a degree in Natural Sciences. In 1947, he was called up for National Service in the Royal Navy and spent two years stationed in North Wales and the Firth of Forth.

In 1950, Attenborough married Jane Elizabeth Ebsworth Oriel; the marriage lasted until her death in 1997. The couple had two children, Robert and Susan.

First Years at the BBC :

After leaving the Navy, Attenborough took a position editing children's science textbooks for a publishing company. He soon became disillusioned with the work, however, and in 1950 he applied for a job as a radio talks producer with the BBC. Although he was rejected for this job, his CV later attracted the interest of Mary Adams, head of the Talks (factual broadcasting) department of the BBC's fledgling television service. Attenborough, like most Britons at that time, did not own a television, and he had seen only one programme in his life. [2] However, he accepted Adams' offer of a three-month training course, and in 1952 he joined the BBC full time. Initially discouraged from appearing on camera because Adams thought his teeth were too big, [3] he became a producer for the Talks Department, which handled all non-fiction broadcasts. His early projects included the quiz show *Animal, Vegetable, Mineral?* and *Song Hunter,* a series about folk music presented by Alan Lomax.

Attenorough's association with natural history programmes began when he produced and presented the three-part series *The Pattern of Animals.* The studio-bound programme featured animals from London Zoo, with the naturalist Sir Julian Huxley discussing their use of camouflage, aposematism an courtship displays. Through this programme, Atenborough met jack Lester, the curator of the zoo's reptile house, and they decided to make a series about an animal –collecting expedition. The result was *Zoo Quest,* first broadcast in 1954, which Attenborough presented at short notice, due to Lester being taken ill.

In 1957, the BBC Natural History Unit was formally established in Bristol. Attenborough was asked to join it, but declined, not wishing to move from London where he and his young family were settled. Instead he formed his own department, the Travel and Exploration Unit[4], which allowed him to continue to front the *Zoo Quest* programmes as well as produce other documentaries, notably the *Travellers' Tales* and *Adventure* series.

BBC Administration :

From 1965 to 1969 Attenborough was Controller of BBC2. Among the programmes he commissioned during this time were *Match of the Day, Civilisation, The Ascent of Man, The Likely Lads, Man Alive, Masterclass, The Old Grey Whistle Test* and *The Money Programme.* He also initiated televised snooker. This diversity of programme types reflects Attenborough's belief that BBC2's output should be as varied as possible. In 1967, under his watch, BBC2 became the first television channel in the United Kingdom to broadcast in colour.

From 1969 to 1972 he was BBC Television's Director of Programmes (making him responsible overall for both BBC1 and BBC2), but turned down the offer to become Director General of the BBC. In 1972 he resigned his post and returned to programme making

Major Series :

Foremost among Attenborough's TV documentary work as writer and presenter is the "Life" series, which begins with the trilogy: *Life on Earth* (1979), *The Living Planet* (1984) and *The Trials of Life* (1990). These examine the world's organisms from the viewpoints of taxonomy, ecology and stages of life respectively.

They were followed by more specialized surveys: *Life in the Freezer* (about Antarctica; 1993), *The Private Life of Plants* (1995), *The Life of Birds* (1998), *The Life of Mammals* (2002) and his most recent, *Life in the Undergrowth* (2005), which

concerned terrestrial invertebrates. *Life in Cold Blood* (dealing with reptiles and amphibians) is currently in post-production and due for broadcast in 2008. [5] The "Life" series as a whole currently comprises 74 programmes.

Attenborough has also written and/or presented other shorter productions. One of the first after his return to programme-making was *The Tribal Eye* (1975), which enabled him to expand on his interest in tribal art. Others include *The First Eden* (1987), about man's relationship with the natural habitats of the Mediterranean, and *Lost Worlds, Vanished Lives* (1989), which demonstrated Attenborough's passion for discovering fossils. In 2000, *State of the Planet* examined the environmental crisis that threatens the ecology of the Earth. The naturalist also narrated two other significant series: *The Blue Planet* (2001) and *Planet Earth* (2006). The latter is the first natural history series to be made entirely in high-definition.

In May-June 2006, the BBC broadcast a major two-part environmental documentary as part of its *"Climate Chaos"* season of programmes on global warming. In *Are We Changing Planet Earth?* And *Can We Save Planet Earth?*, Attenborough investigated the subject and put forward some potential solutions. He returned to the locations of some of his past productions and discovered the effect that climate change has had on them.

In 2007, Attenborough presented "Sharing Planet Earth", the first programme in a series of documentaries entitled *Saving Planet Earth*. Again he used footage from his previous series to illustrate the impact that mankind has had on the planet. *"Sharing Planet Earth"* was broadcast on 24 June 2007.[6]

Life in Cold Blood is intended to be Attenborough's last major series. In an interview to promote *Life in the Undergrowth,* he stated:

> Once I have completed the reptiles series […] that will be enough. It would complete the survey for me. I will have given a series to every group of animals and when that is done there would be 100 or so hours of DVDs on the shelf.[7]

However, in a subsequent interview with *Radio Times,* he said that he did not intend to retire completely and would probably continue to make occasional one-off programmes.

Other Work :

In 1975, the naturalist presented a BBC children's series about cryptozoology entitled *Fabulous Animals*[8]. This represented a diversion from Attenborough's usual fare, as it dealt with the creatures of myths and legends, such as the griffin and kraken. It was a studio-based production, with the presenter describing his subjects with the aid of large, ornately illustrated books.

From 1983, Attenborough worked on two environmentally-themed musicals with the WWF and writers Peter Rose and Anne Conlon. *Yanomamo* was the first, about the Amazon rainforest, and the second, *Ocean World,* premiered at the Royal Festival Hall in 1991. They were both narrated by Attenborough on their national tour, and recorded on to audio cassette. *Ocean World* was also filmed for Channel 4 and later released.

Between 1977 and 2005, Attenborough also narrated over 250 editions of the half-hour BBC1 nature series *Wildlife on One*[9] (BBC2 repeats were retitled *Wildlife on Two*). Though his role was mainly to narrate other people's films, he did on rare occasions appear in front of the camera.

Attenborough also serves on the advisory board of BBC Wildlife magazine.

Achievements, Awards and Recognition :

- 1970 : BAFTA Desmond Davis Award
- 1974 : Commander of the Order of the British Empire (CBE)
- 1979 : BAFTA Fellowship
- 1983 : Fellow of the Royal Society (FRS)

- 1985 : Knighthood
- 1991 : Commander of the Royal Victorian Order (CVO) for producing Queen Elizabeth II's Christmas broadcast for a number of years from 1986
- 1996 : Companion of Honour (CH) "for services to nature broadcasting"
- 2000 : International Cosmos Prize
- 2003 : Michael Faraday Prize awarded by the Royal Society
- 2004 : Descartes Prize for Outstanding Science Communication Actions
- 2004 : Caird Medal of the National Maritime Museum
- 2005 : Order of Merit (OM)
- 2005 : Nierenberg Prize for Science in the Public Interest
- 2006 : National Television Awards Special Recognition Award
- 2006 : Institute of Ecology and Environmental Management (http://www.ieem.net/) - Institute Medal in recognition of his outstanding contribution to the public perception and understanding of ecology
- 2006 : The Culture Show British Icon Award (http://www.bbc.co.uk/arts/livingicons/bio01.shtml)
- 2007 : British Naturalists' Association Peter Scott Memorial Award

On 13 July 2006, Attenborough, along with his brother Richard, were awarded the titles of Distinguished Honorary Fellows of the University of Leicester "in recognition of a record of continuing distinguished service to the University."[10] David Attenborough was previously awarded an Honorary Doctor of Letters degree by the university in 1970.[11]

In 1993, after discovering that the Mesozoic reptile Plesiosaurus conybeari had not, in fact, been in true plesiosaur, the paleontologist Robert Bakker renamed the species *Attenborosaurus conybeari* in Attenborough's honour.[12]

Out of four extant species of echidna, one is named after him : Sir David's Long-beaked Echidna, *Zaglossus attenboroughi,* which inhabits the Cyclops mountains in the Papua province of New Guinea.

In June 2004, Attenborough and Sir Peter Scott were jointly profiled in the second of a three part BBC Two series, *The Way We Went Wild,* about television wildlife presenters. Part three also featured Attenborough extensively. The next month, another BBC Two programme, *Attenborough the Controller,* recalled his time as Director of Programmes for BBC2.

In November 2005, London's Natural History Museum announced a fundraising campaign to build a communications center in Attenborough's honour. The museum intends to open the David Attenborough Studio in 2008.[13]

An opinion poll of 4,900 Britons conducted by *Reader's Digest* in 2006 showed Attenborough to be the most trusted celebrity in Britain.[4] In a list compiled by the magazine *New Statesman* in 2006, he was voted tenth in the list of "Heroes of our time".[15]

It is often suggested that David Attenborough's 50-year career at the BBC making natural history documentaries and traveling extensively throughout the world has probably made him the most travelled person on Earth ever.[16]

His contribution to broadcasting was recognized by the 60-minute documentary *Life on Air,* transmitted in 2002 to tie in with the publication of Attenborough's similarly titled autobiography. For the programme, the naturalist was interviewed at his home by his friend Michael Palin (someone who is almost as well-travelled). Attenborough's

reminiscences are interspersed with memorable clips from his series, with contributions from his brother Richard as well as professional colleagues. *Life on Air* is available on DVD as part of *Attenborough in Paradise* and *Other Personal Voyages.*

Favourite Attenborough Moments:

In April 2006, to celebrate Attenborogh's 80th birthday, the public were asked to vote on their favourite of his television moments, out of twenty candidates. The results were announced on UKTV on 7 May. Each is given with its series and advocate:

1. Attenborough watching a lyrebird mimicking various noises (*The Life of Birds,* selected by Bill Oddie)
2. Mountain gorillas (*Life on Earth,* Sanjeev Bhaskar)
3. Blue whale encounter (*The Life of Mammals,* Alan Titchmarsh)
4. His description of the demise of Easter Island's native society (*State of the Planet,* Charlotte Uhlenbroek)
5. Chimpanizees using tools to crack nuts (*The Life of Mammals,* Charlotte Uhlenbroek)
6. A grizzly bear fishing (*The Life of Mammals,* Steve Leonard)
7. Imitating a woodpecker to lure in a real one (*The Life of Birds,* Ray Mears)
8. The presenter being attacked by a displaying male capercaillie (*The Life of Birds,* Bill Oddie)
9. Chimps wading through water on two feet (*The Life of Mammals,* Gavin Thurston)
10. Observing a male bowerbird's display (*The Life of Birds,* Joanna Lumley)
11. Watching elephants in a salt cave (*The Life of Mammals,* Joanna Lumley)
12. Wild chimps hunting monkeys (*The Trials of Life,* Alastair Fothergill)
13. Freetail bats leaving a cave and Attenborough holding one of their young (*The Trials of Life,* Rory McGrath)
14. Being threatened by a bull elephant seal (*Life in the Freezer,* Björk)
15. A wandering albatross chick and its parent (*Life in the Freezer,* Ellen MacArthur)
16. Spawning Christmas Island red crabs (*The Trials of Life,* Simon King)
17. In a tree with gibbons (*The Life of Mammals,* Steve Leonard)
18. Burrowing under a termite mound to demonstrate its cooling system (*The Trials of Life,* Björk)
19. Observing a titan arum (*The Private Life of Plants,* Alan Titchmarsh)
20. Timelapse footage of a bramble growing (*The Private Life of Plants,* Rory, McGrath)

Parodies and Artistic Portrayals :

Attenborough's accent and hushed, excited delivery have been the subject of frequent parodies by comedians, most notably Spike Milligan, Marty Feldman, *The Goodies and South Park*. Especially apt for spoofing is Attenborough's pronunciation of the world "here" when using it to introduce a sentence, as in, "He-eah, in the rain forest of the Amazon Basin…"

Attenborough is portrayed by Michael Palin in the final episode of Monty Python's Flying Circus, where he searches the African jungle for the legendary Walking Treee of Dahomey (*Quercus Nicholas Parsonus*), sweating excessively and accompanied by native guides wearing saxophones.

Attenborough also appears as a character in David Ives' play *Time Flies,* a comedy focusing on a romance between two mayflies.

In the documentary *In the Wild: Lemurs with John Cleese,* while trekking through the forest in Madagascar, Cleese points as if to have seen an exotic creature and exclaims, "It's David Attenborough!"

On an episode of *The Ricky Gervais Show,* Karl Pilkington speculates that David Attenborough is likely careful not to kill any insect pests, imitating Attenborough's inevitable recognition that "that's where I make me money."

"Springfield Up", an episode of the animated series *The Simpsons,* portrays a documentary filmmaker, voiced by former Monty Python member Eric Idle, whose character is based on David Attenborough.

In the late 1980s, an Australian weekly programme called *The Comedy Company* featured a segment with "David Rabbitborough". He got around in a safari suit touring the Melbourne suburbs in the same format as Attenborough, bu this specimens were human beings.

In the 1980s, a TV advertisement for Guiness featured an Attenborough impersonator investigating the odd 'species' of humans who prefer bland lager to flavoursome stout.

In a Finnish TV commercial, Attenborough is impersonated, looking at fireflies-until the lights are turned on by a studio employee going to a soft drink vending machine.

Views and Advocacy

Environmental causes :

From the beginning, Attenborough's major series have included some content regarding the impact of human society on the natural world. The last episode of *The Living Planet,* for example, focuses almost entirely on humans' destruction of the environment and ways that it could be stopped or reversed. Despite this, his programmes have been criticized for not making their environmental message more explicit. Some environmentalists feel that programmes like Attenborough's give a false picture of idyllic wilderness and do not do enough to acknowledge that such areas are increasingly encroached upon by humans.[17]

However, his closing message from *State of the Planet* was forthright :

> The future of life on earth depends on our ability to take action. Many individuals are doing what they can, but real success can only come if there's a change in our societies and our economics and in our politics. I've been lucky in my lifetime to see some of the greatest spectacles that the natural world has to offer. Surely we have a responsibility to leave for future generations a planet that is healthy, inhabitable by all species.

In the last few years, Attenborough has become increasingly outspoken in support of environmental causes. In 2005 and 2006 he bakced a BirdLife International project to stop the killing of albatross by longline fishing boats.[18] He gave public support to WWF's campaign to have 220,000 square kilometers of Borneo's rainforest designated a protected area.[19] He also serves as a vice-president of Fauna and Flora International and president of Leicestershire and Rutland Wildlife Trust. In 2003 he launched an appeal to create a rainforest reserve in Ecuador in memory of Christopher Parsons OBE, the producer of *Life on Earth* an a personal friend, who had died the previous year. Sir David also launched ARKive in May 2003,[20] a global project which had been instigated by Christopher Parsons to gather together natural history media into a digital library, an online Noah's Ark. He later became Patron of the World Land Trust, and an active supporter.

Attenborough has repeatedly said that he considers human overpopulation to be the root cause of many environmental problems. Both his series *The Life of Mammals* and the accompanying book end with a plea for humans to curb population growth so that other species will not be crowded out.

He has recently written and spoken publicly about the fact that he now believed global warming is definitely real, and caused by humans.[21] At the climax of the aforementioned "Climate Chaos" documentaries, the naturalist gives this summing up of his findings:

> "In the past, we didn't understand the effect of our actions. Unknowingly, we sowed the wind and now, literally, we are reaping the whirlwind. But we no longer have that excuse: now we do recognize the consequences of our behaviour. Now surely, we must act to reform it: individually and collectively; nationally and internationally – or we doom future generations to catastrophe."

In a 2005 interview with BBC Wildlife magazine, Attenborough said he considered George W.Bush to be the era's top "environmental villain". In 2007, he further elaborated on the USA's consumption of energy in relation to its population. When asked if he thought America to be " the villain of the piece", he responded:

> "I don't think whole populations are villainous, but Americans are just extraordinarily unaware of all kinds of things. If you live in the middle of that vast continent, with apparently everything your heart could wish for just because you were born there, then why worry? […] If people lose knowledge, sympathy and understanding of the natural world, they're going to mistreat it and will not ask their politicians to care for it."[6]

Other Causes :

In May 2005, Attenborough was appointed as patron of the UK's Blood Pressure Association, which provides information and support to people with hypertension.[22]

Sir David Attenborough is also an honorary member of BSES Expeditions, a youth development charity that operates challenging scientific research expeditions to remote wilderness environments.

Religion and Creationism :

In a December 2005 interview with Simon Mayo on BBC Radio Five Live, Attenborough stated that he considers himself an agnostic.[23]When asked whether his observation of the natural world has given him faith in a creator, he generally responds with some version of this story:

> My response is that when Creationists talk about God creating every individual species as a separate act, they always instance hummingbirds, or orchids, sunflowers and beautiful things. But I tend to think instead of a parasitic worm that is boring through the eye of a boy sitting on the bank of a river in West Africa, [a worm] that's going to make him blind. And [I ask them], 'Are you telling me that the God you believe in, who you also say is an all-merciful God, who cares for each one of us individually, are you saying that God created this worm that can live in no other way than in an innocent child's eyeball? Because that doesn't seem to me to coincide with a God who's full of mercy.[24]

He has explained that he feels the evidence all over the planet clearly shows evolution to be the best way to explain the diversity of life, and that "as far as I'm concerned if there is a supreme being then he chose organic evolution as a way of brining into existence the natural world."

In a BBC Four interview with Mark Lawson Sir David, in answer to the question "Have you at any time had any religious faith?" replied "No."

In 2002, Attenborough joined an effort by leading clerics and scientists to oppose the inclusion of creationism in the curriculum of UK state-funded independent schools which receive private sponsorship, such as the Emmanuel Schools Foundation.

Work :

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  - Paperback (Penguin Books, 1982)
- *Quest in Paradise* (1960)
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- *Quest Under Capricorn* (1963)
- *Fabulous Animals* (BBC, 1975) ISBN 0-563-17006-9
- *The Tribal Eye* (1976)
- *Life on Earth* (1979)
- *Discovering Life on Earth* (1981)
- *The Living Planet* (1984)
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- *The Life of Mammals* (BBC Books, 2002) ISBN 0-563-53423-0
- *Life on Air:* Memoirs of a Broadcaster (autobiography; 2002) ISBN 0-563-53461-3
  - Paperback: ISBN 0-563-48780-1
- *Life in the Undergrowth* (BBC Books, 2005) ISBN 0-563-52208-9
- *Amazing Rare Things* – The Art of Natural History in the Age of Discovery with Susan Owens, Martin Clayton and Rea Alexandratos (The Royal Collection, 2007) Hardback-ISBN 978 1 902163 46 8; Softback – ISBN 978 1 902163 99 4
- *Life in Cold Blood* (BBC Books, 2007) ISBN 9780563539223

Introductions :

Attenborough has written the introduction or foreword for a number of books, including:

- *African Jigsaw :* A Musical Entertainment, Peter Rose and Anne Conlon (published:1986, Weinberger)
- *Life in the Freezer :* Natural History of the Antarctic, Alastair Fothergill (BBC Books, 1993), ISBN 0-563-36431-9
- *Birds of Paradise :* Paradisaeidae (Bird Families of the World series) Clifford B. Frith, Bruce M. Beehler, William T. Cooper (Illustrator) (Oxford University Press, 1998) ISBN 0-19-854853-2

- *The Blue Planet,* Andrew Byatt, Alastair Fotthergill, Martha Holmes (BBC Books, 2001) ISBN 0-563-38498-0.
- *Light on the Earth* (BBC Books, 2005), two decades of winning images from the BBC Wildlife Photographer of the Year competition, ISBN 0-563-52260-7
- *Planet Earth,* Alastair Fothergill (BBC Books, 2006), ISBN 0-563-52212-7

DVDs

Major programmes

A number of Attenborough's programmes have been available on video; most are now out-of-print. These DVDs are available (unless stated, dates are of original transmission):

- *The Tribal Eye* (1975): to be released 27/8/2007[25]
- *Life on Earth* (1979)
- *The Living Planet* (1984)
- *The First Eden* (1987): to be released 27/8/2007[25]
- *Lost Wolds, Vanished Lives* (1989)
- *Trials of Life* (1990)
- *Life in the Freezer* (1993)
- *The Private Life of Plants* (1995)
- *Survival Island* (1996)
- *The Life of Birds* (1998)
- *State of the Planet* (2001)
- *The Life of Mammals* (2002)
- *Life in the Undergrowth* (2005)
- *Life in Cold Blood:* (predicted to be Spring 2008)
- *Great Wildlife Moments* with David Attenborough (compilation)
- *Great Natural Wonders and Greatest Wildlife Show on Earth* (2005) (Two specials released in Australia only)
- *Wildlife Special: The Tiger*
- *Wildlife Special: The Eagle*
- *Wildlife Special : The Leopard*
- *Wildlife Special : The Serpent*
- *Attenborough in Paradise and Other Personal Voyages* includes seven one-off documentaries:
  - *Attenborough in Paradise:* 1996-04-08
  - *The Lost Gods of Easter Island:* 2000-04-24
  - *The Amber Time Machine:* 2004-02-15
  - *Bowerbirds:* The Art of Seduction : 2000-12-17
  - *The Song of the Earth:* 2000-12-23
  - *A Blank on the Map:* 1971-12-29
  - *Life on Air:* 2002-11-20
- *The Life Collection,* a comprehensive box set, was released 5 December 2005
- *Planet Earth* (2006)

Narrated by Attenborough :

- *A Zed & Two Noughts* (film drama)

- *Tarka the Otter* by Henry Williamson, read by David Attenborough (available on audiocassette, 1978)
- *Yanomamo* (musicalk entertainment, 1983) by Peter Rose and Anne Conlon; on-stage narration and published audio recording
- *Ocean World* (musical entertainment, 1990) by Peter Rose and Anne Conlon; on-stage narration (including at The Royal Festival Hall), for audio recording and video broadcast (both published)
- *Tom Harrisson:* The Barefoot Anthropologist

  (http://observer.guardian.co.uk/review/story/0,1989676,00.html) (documentary, 2006/7)
- *Climate Change:* Britain Under Threat (http://www.bbc.co.uk/sn/hottopics/climatechange/) (documentary, also presented, 21 January 2007)

Character Voice:

- Voice of the museum commentary in Robbie the Reindee: *Legend of the Lost Tribe*

Other Programmes

Author and Producer :

- *Zoo Quest*
- *Eastwards with Attenborough*
- *The Tribal Eye*

Producer :

- 1986 to 1991, The Queen's Christmas Message

Source :

"http://en.wikipedia.org/wiki/David_Attenborough"

- **Mankind has Probably done more damage to the earth in the 20th Century than in all of Previous human history.**
- **"If we [humans] disappeared over night, the world would Probably be better off." The Daily Telegraph, London, 12, November, 2005**

… David Atenborough

Kalinga Laureate for Popularization of Science – 1981

Mr. Dennis Flanagan, USA

[Born: 22nd July, 1919
Died :14th January, 2005, New York]

"Science is what Scientists do, not what non scientists think they do or ought to be doing."

...Dennis Flanagan

"Actually I like the idea of being a Renaissance hack. If tombstones were still in style, I would want to have the two words chiseled right under my name.

In an age of specialization people are proud to be able to do one thing well, but if that is all they know about, they are missing out on much else life has to offer."

...Dennis Flanagan

DENNIS FLANAGAN : A PROUD "RENAISSANCE HACK"
by
John Rennie
January 30, 2005

Dennis Flanagan :

In 1947, Flanagan, a former editor of Life magazine, and two friends bought the magazine Scientific American, which at the time had a circulation of 40,000. As its new editor, he made a few changes. First, he dictated that the people doing research should be the primary authors of articles in the magazine, and second, the published articles should be readable by people other than scientists. He recruited scientists like James D. Watson, Hans Bethe, Linus Pauling, J. Robert Oppenheimer and Albert Einstein to write articles, and then edited them so they were readable by a lay audience, and ran book reviews. He hired Martin Gardner to create fun but interesting puzzles. "He had a tremendous influence on science journalism," says Leon Jaroff, former science editor at Time magazine. "Before, much of science journalism was largely incomprehensible to the layperson." By the time he retired in 1984, circulation was up to 600,000 exceeding many popular general interest magazines. He died at home an January 14 from prostate cancer. He was 85.

I've revised this entry with the help of Barbara Flanagan, Dennis's widow, who caught several small errors and provided me with a wealth of other detail about this wonderful man. I'm posting this obituary here as my personal statement; a copy is also posted here on the Scientific American home page.)

Dennis Flanagan, whose nearly four-decade tenure as editor of Scientific American transformed science journalism and educated untold millions about the wonders of science, passed away on January 14. The cause of his death was prostate cancer.

Flanagan's death falls only a few months after that of the man with whom he was long professionally linked, Gerard Piel, Scientific American's former publisher and chairman. Flanagan and Piel, along with a small group of investors, purchased the magazine in 1947 and changed it from a rather quirky mix of science, inventions and mechanical hobby craft into the world's premier voice of authoritative, intelligent science coverage. Both retired form active involvement with the magazine in the mid-1980s, when they sold it to its current owners.

Their partnership was an outgrowth of working together at Life magazine in the 1940s; Flanagan succeeded Piel as that magazine's science editor. Scientific American came to embody the enthusiasm and vision that the two men had for what a modern science magazine could be.

Of course, not everyone appreciated Flanagan and Piel's Scientific American right off the bat. In the months after the magazine's May 1948 debut, it published a modest number of congratualatory letters, but also one that began, "Sirs: I have been trying to read the May issue of your magazine. Man, oh man. You have ruined the finest shop and hobby magazine in the world. Gone high-brow…"

At Scientific American, Flanagan edited with a clear philosophy that "Science is what scientists do,"

which lent the magazine its breadth of interests in all areas of research endeavor. Perhaps the best testament to the quality of his work (it surely gave Flanagan great pleasure) was a quote that has been attributed to the poet Robert Frost: "There are only two really great literary magazines in the United States. First is The New Yorker. The more brilliant of the two is Scientific American. It's come up with a great editorship. I'd rather read the advertisements in Scientific American than most of the literature written elsewhere."

In 1999, Flanagan was inducted into the American Society of Magazine Editors Hall of Fame.

Magazine editors were once a fairly anonymous breed, not that you would know it by the current self-promoting crop (and believe me, I put myself in that company). Inspect the 37 years of issues that Dennis Flanagan edited and you will look in vain for his byline. Flanagan never openly wrote a single article for his own publication. Yet, his impeccable editorial judgment informed every line in those issues with clarity and intelligence.

Let me rectify the absence of Flanagan's by line. If only posthumously. Late in November, Flanagan sent me a brief letter- the last communication I ever had with him – explaining that he had recently related this anecdote to his wife Barbara and she had encouraged him to write it up for us.

HOW SCIENTIFIC AMERICAN GOT ITS NEW NAME :

By Dennis Flanagan

Readers of Scientific American know that it got its name in 1845, because it says in the magazine "SCIENTIFIC AMERICAN established 1845". But almost no one knows that it had to be renamed soon after the new science magazine was invented by two Life magazine writers, Gerard Piel and myself. At that time Piel was seeking funding for a magazine that was to be titled The Sciences.

Then an interesting thing happened. The old Scientific American had a department titled "Telescoptics." Written by Albert G. Ingalls, it was addressed to the interests of a small but passionate group of people who enjoyed making their own astronomical telescopes. Ingalls called them TN's, or telescope nuts, and he kept in close touch with many of them by means of legendary postal cards always signed "Doc". (Although he was enormously well-informed about telescope-making, he was not a Ph.D.) Now, one of the receivers of Ingalls's cards was my stepfather, Lawrence Braymer. A commercial artist by trade, he too was a telescope nut. (Later he became a professional telescope-maker, making a well-known small telescope named Questar.) One day Braymer received a card from Ingalls bearing sad news: Scientific American was going out of business!

The card arrived in the same period when Piel was raising money to start the new magazine titled The Sciences. When I told him the news, we looked at each other with the same thought. Instead of starting a new science magazine titled The Sciences, why didn't we start a new magazine with the old title Scientific American? We liked the title for itself, and although the magazine was then in sad shape, it had seen great days and would give us a ready-made history. (Later our General Manager, Donald H. Miller, Jr., discovered that it had another great asset: It had office space and a telephone number, both of which were hard to come by in the postwar years.)

Piel had already had some success in raising money for The Sciences, and we now asked our investors if they would consider buying and rejuvenating an old magazine instead of starting a new one. They liked the idea, and the first issue of the new Scientific American appeared in May, 1948.

(Postscript: The only department of the old magazine we retained in the new one was "Telescoptics." We renamed it "The Amateur Telescope Maker," and Ingalls continued writing it for some years.)

As an author, Flanagan is best remembered for his book Flanagan's Version, a wide-ranging rumination on science that combines exposition, narrative and anecdote, and that beautifully captures his genial astonishment at the natural world and at researchers' ingenuity in plumbing it.

Flanagan's friends and coworkers have many stories about him. My own contacts with him were too brief to qualify me for their company, but shortly after I was named editor in chief, Flanagan and I had lunch at the Century Club, where he was a member. Imagine my apprehension as I hesitantly discussed my plans for introducing some modernizing changes to the magazine; I was not only presuming to talk editing with a legend of the profession but also implicitly suggesting that his beautiful baby needed a nose job. Flanagan was tremendously encouraging, however, and said that he welcomed any changes that would help to keep the magazine respected and vital. At one point, I confessed that it was intimidating to take the reins of an institution so venerable as Scientific American when I was only 35 years old. Flanagan smiled and replied, "You must remember, I was only 27 when I did it."

Perhaps the most famous story about Flanagan, one immortalized in his book and repeated in his New York Times obituary, tells of the time he ran into film critic Pauline Kael at a luncheon and reproached her for boasting that she knew nothing of science. Kael reportedly replied, "Oh, you're a Renaissance hack!"

"It was a genial insult, and I had a good laugh," Flanagan wrote. "Actually I like the idea of being a Renaissance hack. If tombstones were still in style, I would want to have the two words chiseled right under my name. In an age of specialization people are proud to be able to do one thing well, but if that is all they know about, they are missing out on much else life has to offer."

Flanagan never missed a thing.

Dennis Flanagan Quotes

- "Actually I like the idea of being a Renaissance hack. If tombstones were still in style, I would want to have the two words chiseled right under my name."
- "But almost no one knows that it had to be renamed soon after the new science magazine was invented by two Life magazine writers, Gerard Piel and myself."
- "In an age of specialization people are proud to be able to do one thing well, but if that is all they know about, they are missing out on much else life has to offer."
- "Instead of starting a new science magazine titled the Sciences, why didn't we start a new magazine with the old title Scientific American?"
- "Science is what scientists do."
- "We liked the title for itself, and although the magazine was then in sad shape, it had seen great days and would give us a ready-made history."

Kalinga Laureate for Popularization of Science – 1982

Dr. Oswaldo Frota Pessoa, Brazil

[Birth : 30th March, 1917, Rio De Janeiro, Brazil
Died : 24th March 2010]

Any Knowledge can be used for the good and for the evil, therefore, it fits to the Scientific communicators not only to teach & to divulge science, but also "to unteach" the enganosas Pseudos- Science and Propagandas.

…. Oswaldo Frota Pessoa

The Researchers must identify & explain to the society where they are the "fallacies" of the Pseudos – Science, that they have searched to use the Population as maneuver mass.

… Oswaldo Frota Pessoa

"Who Writes on Science transits in a battlefield"

... Oswaldo Frota Pessoa

National Order of the Scientific Merit Oswaldo Frota – Pessoa

A Brief Biographical Profile

Oswaldo Frota-Pessoa (b. March 30, 1917, Rio de Janeiro) is a noted Brazilian physician, biologist and geneticist.

Oswaldo Frota-Pessoa was born in Rio de Janeiro, where he did all his studies, first in natural history at the Federal District University (currently the State University of Rio de Janeiro), graduating in 1938; and subsequently medicine at the National School of Medicine of University of Brazil, graduating in 1941. He got his doctoral degree at the same school, in 1953 and soon afterwards went abroad on a scholarship for post-doctoral studies at Columbia University, in New York City, from 1953 to 1955. His teaching and research professional career began in 1942, when he accepted a position of assistant professor at the School of Philosophy, Sciences and Letters of the Federal University of Rio de Janeiro, a post he held until 1958. In that year he accepted a new position at the University of São Paulo, moving to São Paulo City, where he worked until his retirement . He attained a full professorship there in1978 and was elected an emeritus professor in1995. In1964 and 1965 he was a Visiting Professor at the University of Wisconsin-Madison on a Fulbright Program fellowship.

As a scientific leader, Dr. Frota-Pessoa held many prominent positions, such as : specialist in Science Education of the Pan American Union (Organization of American States) in Washington, D.C. (1955-1956), consultant in Human Genetics for the World Health Organization (1961-1986), director of the Coordination Center of Brazil of the Multinational Program of Genetics of the Pan American Union (1968-1973), director of the Centro de Estudos sobre Currículo para o Ensino de Biologia (CECEB) from 1972 to 1979, president of the Brazilian Society of Genetics (1968-1970) and of the Latin American Association of Genetics (1969-1971), founding member of the Academy of Sciences of the State of São Paulo (1974). He has published more than 130 research papers on genetics and about 500 popularization articles.

His main research interests have been the systematics of Drosophila, the genetics of human populations, cytogenetics, medical genetics and genetic counseling, and genetics in psychiatry.

Dr. Frota-Pessoa has always been one of the most active and respected enthusiasts for the teaching of biology and the popularization of science and promoter of public understanding of science. He actually taught science and biology in secondary schools of the public system of Rio de Janeiro from 1939 to 1958. Based on this experience, he wrote one of the first textbooks on biology for secondary education, which became a best-seller, going through many editios. In all, he published 26 textbooks and 17 guides for science and biology

teachers. For these efforts, he won the UNESCO Kalinga Prize for the Popularization of Science and the CNPq José Reis Award for the Divulgation of Science. He was also decorated by the Brazilian government with the Great Cross of the Brazilian Order of Scientific Merit and was awarded the 1989 Alfred Jurzikowyski Prize of the Brazilian Academy of Medicine, for relevant basic research for medicine.

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External links :

- Biography (http://www.abc.org.br/english/orgn/acaen.asp?codigo=oswaldo). Brazilian Academy of Sciences.

Source :

"http://en.wikipedia.org/wiki/Oswaldo_Frota-Pessoa"

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Learning with projects that teach

by

Oswaldo Professor Frota-Pessoa

(Literal transcription of recorded lecture during congress

IBOPE-UNESCO, Sao Paulo, 12/11/2002)

Why it will be that the method of traditional education resists all the efforts that if come making have 50 years so that it disappears? I find that the case is that all the professors already had been children and therefore had been submitted to the classic method of speaking and making test, and what it is penetrated during infancy, adolescence, in this way, is very difficult to subject through an academic quarrel, that also does not result in nothing.

Then, I see in the project Our School Research its Opinion, that vocês is leading avante, an inestimable quality-it involves professors and pupils in one same emotional wave that makes with that they suffere together and prepare its ideas in a burning way and fast e, suddenly, you see a school that was in the top of the tradicionalidade to start to present hope signals.

I find that the proper professor, if equaling the pupil to discover the problems of it, is making one catarse personal also, without a doubt none, of all the participants who used to advantage more and improved more had been the professors. This is the great beauty of this method. We can start to modify practical pedagogical of the professors quickly- The thing that the facultieses of education until had today not obtained, and need to invade with these new methods the proper facultieses of education, to see if they start to teach as to teach.

I have the impression of that the relations between this methodology of projects and the practical daily pertaining to school will attract greater attention, of

now in ahead, of vocês that carry through these experiences. My concern, then that I started to understand what vocês they are making, was the following one – when finishes the project, what it happens? The pupils come back to seat in the wallet and to copy what the professor says, because "has that to give the substance"? It has an abyss there, between these two things, and my intuition is of that vocês they will be, each time more, attracted by an examination that advanes for the general resume of the school, not being imprisoned to this project, or either, the project opens the doors and vocês needs to enter for these doors to remodel the education of the pedagogia, the education of as to teach, that it continues lamentable until today.

The joint emotional mobilization of the pupils and professors in these projects is the rock of touch of its effectiveness. The professor has that to suffer together with the pupils, they have that to have doubt together, they have that to argue together and thus they improve all. The education facultieses needed to know this battle that vocês they had described here so that they are interested themselves n making some similar thing. It is essential that this movement comes to contaminate with new methods the bastions of the pedagogical facultieses and the courses of teaching, that come for there also with all force.

Then, in summary, I was really, fantastic involved with whom I heard here. Given a biological phenomenon of longevity, I obtained to compare this problem of education of today with it I have 80 years behind, and to verify the following one-in the decade of 30 he had a great movement in Brazil, mainly in Rio De Janeiro, for the improvement of the education techniques. The method of projects started to empolgar first the primary teachers. It has one occasion of the primary schools, that made with that the families of upper-middle class were in the line to obtain vacant in primary the public school, because they were the best ones.

This movement if did not project for very, but it contaminated, for example, education in the university of the Federal District, where I was pupil. The professors of biology and zoology, since the first day of lesion, in placed them choosing projects to execute in contact with the nature. People left for the weeds to choose the animals, to study the problems of these animals, not to be hearing what the professor said.

Nowadays almost this is not seen. University education continues with a load of falação, falação enormous falação. Later, it had other surtos of improvement of education with the CECIS – the Centers of Education of Sciences. It had stocking dozen of them in Brazil: in Recife, in Porto Alegre, in Rio De Janeiro and São Paulo and they were formed by pioneering groups to improve the education of sciences in the schools. This process delayed some years and later one another one appeared, financed for the CAPES, where groups of professors of some parts of Brazil if joined to produced material didactic, through which, they induced the professors to teach for better methods.

Finally we have, at the time more recent, the formation of the science centers as, for example, the Museum of sciences of the Oswaldo Institute Cross in the River and the Station Science in São Paulo that keeps, permanently, open to the visitation of students and professors its didactic devices of research.

Then I would like to externar my surprise for the effectiveness of the method that vocês is using. This will also be made with suffering and joy to the measure that vocês to obtain to mobilize after the projects and saying-listening here, this project finished, and now what it happens with these pupils? They come back it room and go to continue copying the dictated one of the professor? She is not possible, then we got to call these professors who had still not been involved in the process and to make a project to improve the education that continues, remainder, later that the project of one searches if it locks up.

Kalinga Laureate for Popularization of Science -1983

Dr. Abullah-Al-Muti Sharafuddin, Bangladesh

[Born: 1st January, 1930, Fulbari, Sirajganj
Died : 30th November, 1998]

Normally, Scientists write for Scientists and it becomes diffcult for the Scientists to write for the layperson.

... Dr. Abdullah-Al-Muti Sharafuddin

Abdullah-Al-Muti Sharafuddin
A Biographical Sketch

Sharafuddin, Abdullah Al-Muti (1930-1998) educationist, administrator and science writer. Born on 1 January 1930 in the village Fulbari, Sirajganj. Abdullah Al-Muti Sharafuddin obtained MSc degree (1953) in Physics from the UNIVERSITY OF DHAKA and MA (1960) and PhD (1962) in Education from the University of Chicago, USA.

A former Secretary of the Ministry of Science and Technology, Sharafuddin began his service career as a teacher in a government college. Subsequently he held many positions, including Director of Education Extension Centre, Dhaka; Director, Public Instruction; Counsellor, Education and Culture to different Embassies. After retirement he was appointed Chief Adviser to the Secondary Science Education Project of the ADB-UNDP.

Al-Muti Sharafuddin made considerable contribution to the field of science education in Bengali language and took the lead in popularizing science among the younger generation. He published 28 books on science, education and environment; notable among these are Bijnan O manush, A Juger Bijnan, Bipanna Paribesh, Bijnana Jiggasha, Sagorer rahoshyapuri, Megh Bristi Rodh, and Poribesher Sankat Ghoniye Aschhe. He won over a dozen of prestigious awards including Independence Day Award, Ekushey Padak, Bangla Academy Award, Shishu Academy Award, Kalinga Award of UNESCO, and Kudrat-e-Khuda Gold Medal in recognition of his remarkable contributions in the fields of science, education and literature.

Al-Muti Sharafuddin was the Chief Editor of the Bijnan Biswakosh (Science Encyclopedia) published by BANGLA ACADEMY, and editor of Mukul, a juvenile magazine . He was actively associated with various socio-cultural organizations such as the Shahitya Sangsad, Progati Lekhak Sangha, Kendrio Konchi Kanchar Mela, Bangladesh Shishu Academy, Bijnan Sangskriti Parishad, and Human Development Foundation. He was the founding Fellow of the Islamic Academy of Science, and a Fellow and President of the ASIATIC SOCIETY OF BANAGLADESH (1988-91).

Sharafuddin was also the President of the Bangla Academy (1986-90), Vice-President of the Foundation for Research on Planning and Development (1993), President of Bangladesh Association for Science Education (1988-95), Executive Member of International Council of Associations for Science Education (1989-93), and Member of the International Scientific Council (nominated by the Director General of UNESCO). Until his death on 30 November 1998, he was the Chairman of the Project Implementation Committee of the National Encyclopedia of Bangladesh Project of the Asiatic Society of Bangladesh. [Sajahan Miah]

Source : Banglapedia

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SPEAKING SCIENCE

AN INTERVIEW WITH DR ABDULLAH AL-MUTI SHARAFUDDIN

by

Chin Saik Yoon

IDRC Communications Division Regional Liaison Officer for Asia

Dr. Abdullah Al-Muti Sharafuddin, Secretary of the Science and Technology Division in the Ministry of Education in Bangladesh, has been communicating on science for more than 40 years. In 1983, his efforts to promote "Science Literacy" in Bangladesh were recognized by UNESCO, which awarded him the Kalinga Prize. Dr Sharafuddin's concern has been to imbed Science in Bangladeshi culture using the most sensitive of tools-language. Chin Saik Yoon, IDRC Communications Division Regional Liaison Officer for Asia spoke with Dr Sharafuddin recently in Bangaldesh.

Reports :

How did science and Bengali become linked?

Sharafuddin :

Ever since the British left the subcontinent in 1947, our people had been demanding that their language, Bengali, should be made a state language. But the administration of the day had different ideas, and for that simple demand, on 21 February 1952, several students and others taking part in a demonstration in Dhaka had to lay down their lives. This sacrifice, and many others subsequently, did not go in vain. The language movement ultimately led to a massive national liberation movement. Thus Bangladesh, with more than 90 million people, practically all speaking the same tongue, is today a sovereign state and Bengali is our state language.

I was a University student in those days and, along with many others, took direct part in the language movement was even thrown in jail for almost a year. We are glad that our people finally won the right to use their language in national affairs. This movement was one of the factors that inspired some of us to begin writing extensively on science and technology in our own language. We felt that language is a vehicle not only for conveying emotions and feelings through poems and other forms of literature, of which we have a rather rich tradition, but that science and technology, which are the main instruments for moulding the lives of the people today, have an equal claim on language. This communication, moreover, should be at various levels - as the mother tongue should be used as a medium of instruction at different stages of formal education, there must be adequate literature to communicate science and technology to the lay people.

Reports :

And what approach do you take creating this literature? Would it be your work goes beyond books?

Sharafuddin :

I write in a language that is more or less a spoken language; I mean, most people cannot distinguish between my writing and my speech. I don't just simply write, but I try to plan a book with all kinds of special effects.

What I mean is I have given attention to pictorial presentation of the scientific principles, not in a stilted scientific fashion, but in a popular fashion that would appeal to the imagination of youngsters and adults. And also, my style has been such that it is a very simple language. I always start with very basic principles in a manner not taking anything for granted. Normally, scientists write for scientists and it becomes difficult for the scientist to write for the layperson. But I take nothing for granted, I assume that my readers are all like children. Many of my articles for example, have been presented in children's' groups and, therefore I have tried to combine talking and reading and writing together.

Reports :

Do you find the Bangali language able to cope with scientific and technological terminology?

Sharafuddin :

Now my feeling is that our language is constructed in a way such that many abstract ideas can be conveyed. The deficiency has been in terms of technological language.

We have a scientific literature created by nonscientists, where powerful writers have tried writing about science. What is surprising is that our scientists have not come out themselves communicating in such large numbers. Scientists become proficient in their formulas and other things...scientific subjects...and they feel comfortable in communicating in English.

Then we have another stream of writers who are proficient in the Bengali language, but concentrate their language skills on poetry, short stories and novels, and so on, of all various emotional aspects and not about practical things. We have these rich divergencies. What I have tried to do is combine the streams. I mean, richness of the Bengali language and my study of the Bengali literature and whatever acquaintance that I have with our modern writers and my acquaintance with scientists of our present day. I try to combine, to put it together for the layperson, and particularly for the younger generation.

Reports :

Do you perceive any changes, any results from this sort of communication?

Sharafuddin : I think so, But of course I cannot say that the changes are taking place because of my effort alone. There are various factors converging. But there has been quite a change in the notion about science and about the world itself. I will give you a good example when I was a student in university, we had only one university and we had about 1600 students. There were few science students there at that time. Now in all universities we have about 40 000 students instead of 1600, 40 years later. Out of these 40 000 students, 40 percent are now in science and technology, which means 16,000 students are in science. The very fact that 40 percent of today's students have come into science and technology is quite a change form my days, when the number of students was very small compared to the population and the proportion of students studying science was smaller still. And not only is there a great urge for studying science today but also the proportion of girls among the science students is increasing. I mean, girls and boys are coming in equal proportion, and the best students of both genders are taking up science and technology.

I cannot say that we have been entirely successful so far in introducing Bengali as medium of instruction at the higher stages of education. But we are delighted to note that among the younger

generation there is a growing inclination to go in for studies in science and technology. In my own school days, in the early 1940s, we had practically no science in school. Since 1960 all students have to take science as a compulsory subject in secondary schools.

The number of workers in R &D has been showing a corresponding increase. In 1960 we did not have any science laboratory worth that name outside of the universities. Now we have about 60 R & D institutions throughout the country working on problems of national importance.

More than being a subject of study as an academic discipline, among a growing segment of the younger generation science and technology are today being considered a part of the general culture and an absorbing object of recreational interest. For example, I think that it was in 1973 or 1974, the first few science clubs started coming up in some schools and colleges and even in some other venues. Now we have about 450 science clubs throughout the country. Mostly, the members are young people-school students, college students-and they are involving their teachers:college teachers, university teachers and even agricultural specialists . And since 1978, when we started organizing the National Science Week, the science clubs started participating.

All the science clubs would undertake some projects. There were competitions and projects. There were competitions in public speaking on science. Now this is becoming more and more popular. Every year, at least 30,000 people are becoming involved or members of science clubs attendance has grown, and we have started having science fairs, about 460 now, all across the country. These things indicate that science is gradually getting into the lives of the young people and the average person as well.

Reports :

So looking ahead, what role do you see science communications playing?

Sharafuddin :

Wall, I think that science has to find a place in the culture of the country as a whole. For example, we accept sports and games as a part of the culture. Music and dance is a part of the culture. Literature is a part of the culture. Religion is a part of the culture.

Previously, we have been looking at science as a technical device- as an instrument only. When we are sick we need the doctor; or when we have to build a bridge or a house, we find engineers; or somebody has to have a job and therefore needs a skill. But science is a way of thinking. Life is becoming so complex with problems of ecology and Population and food production - non of these problems can be solved unless everybody in the country becomes scientifically literate and has some understanding of the implications of the times-the benefits of science as well as its dangers. And therefore, in order to bring about this cultural change-a cultural revolution, even-we have to have a scientific awareness among the whole population.

And what we are trying to do now is encourage more of our newspapers to have scientific features. We have features on economic problems, we have features on literature, we have a woman's page, we have a cinema page. We have all kinds of pages but we don't have a page on science yet. We are going to try to pursuade newspapers to start a science feature or a science page.

We have a number of science journals: some are monthly, some quarterly. This ministry is trying to patronize these science journals through monthly grants –only a token really-to support and supplement and encourage indigenous publishing.

And, also we are encouraging all kinds of scientific

societies: physics society, chemical society, environment society and all kinds . We are working on science and culture combinations – social organizations that have a component of science. We tend to support them also. And we hope that through their activities, there will be better communication between the scientists, leaders in culture and communication and the average person.

And certainly, we hope to have more publications on science. We have been trying, for example, to set up a national science library, Presently this is a national depository of various sophisticated science books, especially reference books. But as part of the function, we hope that it will also start publishing popular books on science. They have not started doing this yet, but we hope that they will undertake to publish books, textbooks, and other reference books for school students and college students.

At the moment, may be 20 or 30 books annually come out in a popular science mode . We hope this number will be increased. Every year, Bangladesh now produces maybe 2000 books of various kinds. Most of them are standard books, some of them are perhaps trash, but we probably have not more than 20 on science. This is a very small number indeed. We hope this number will increase and we think it can be done only by creating a cadre of people, scientists and science communicators.

As I said, due to all of these efforts, we now do have the beginnings: a group of people who are writing for the journals, for the newspapers, who are writing books. We hope that of course this will have a snowballing effect. In the beginning, when there is only one or two persons, it is very difficult But when you have a group of maybe 20 or 30 its is easier; when you have a few hundred it is easier still. We hope that this will accelerate science literacy in the coming years.

Science has to find a place in the culture of the country, as a whole.

... Dr. Abdullah-Al-Muti Sharafuddin

Kalinga Laureate for Popularization of Science - 1984

Professor Yves Coppens, France

[Born : 9th August, 1934, Vanes (Morbihan).....]

- **The Chance makes the things too well to be credible**
- **Imagination Penetrates everywhere & allows the construction of assumptions.**

...Yves coppens

Yves Coppens – Biographical Sketch

Yves Coppens, in Vannes born Aug. 9, 1934, is a paleontologist and French paleoanthropologist.

It calls into question the current one aspect of the neo-Darwinian theory, the chance, "saying it's too much things to be credible [1].

It supports the thesis that "the technical and cultural development exceeds the biological development", ie that biological evolution has preceded the cultural evolution, the latter being more decisive transformations that our species live.

Biography :

Fascinated by prehistoric times since his childhood, he began very early to participate in the work of excavation and exploration in Brittany, during his years of college, high school and university.

- 1956 : He joined the CNRS in 22 years. He proceeded to the study of the Tertiary and Quaternary periods.
- 1960 : It starts climbing expeditions in Chad, Ethiopia, and Algeria, Tunisia, Mauritania, Indonesia and the Philippines.
- 1965 : He discovered a hominid skull in Yaho (Angamma) appointed *Tchadanthropus uxoris.* Maybe older than one million years, it would be close to *Homo erectus.*
- 1969 : Lecturer at the National Museum of Natural History, is the sub-directorate of the Musée de l' Homme.
- 1974 : Discovery of *Australopithecus afarensis,* named Lucy (in reference to the Beatles song that his co-discoverers Donald Johanson and Maurice Taieb listened: *Lucy in the Sky with Diamonds)*
- 1980 : He was appointed director and lecturer at the Museum for 3 years.
- 1981 : He proposed an environmental explanation of the separation *Hominidae Panidae* in his theory of the "East Side Story".
- 1983 : Elected to the chair of paleontology and prehistory at the College de France.
- 1988 : Yves Coppens has developed and demonstrated how the acquis had taken precedence over the innate, which has slowed including human evolution from several tens of thousands of years.
- 2002 : Under its scientific control (with the collaboration of Anne-Marie Bacon and Sandrine Prat du CNRS), Jacques Malaterre performs for France 3-fiction documentary on the evolution of man, *Species Odyssey,* which is very popular in France and abroad. This documentary, which included a number of errors on key issues, arouses great controversy.
- 2003 : Following the discovery of Toumai and "Abel by the Franco-Chadian team of Michel Brunet, Yves Coppens calls itself into question his theory of" East Side Story.
- 2004 : Under his control scientist, Jacques Malaterre directed Homo sapiens for France 3.

- 2006 : Appointed to the High Council of Science and Technology (Official Journal of 24 September 2006). (http://64.233.179.104/translate_c?hl=en&u=http://www.legifrance.gouv.fr/W Aspad/UnTexteDeJorf%3Fnumjo%DMENR0602373D&prev=search%3Fq %3DYves%2 BCoppens %26hl %3Den)
- 2007 : Guarantee scientist with Jean Guilaine for documentary fiction *Le Sacre de l'Homme.*

Today, Yves Coppens is present in many national and international bodies operating disciplines within its jurisdiction. He also heads a laboratory associated with CNRS: Anthropological Research Center- Musée de l'Homme, and two collections of works of CNRS, Notebooks and Paleoanthropology of the work is Paleonathropology Africa. He is a member of the Academy of Sciences and the Academy of Medicine, Academy of Sciences of Outremer, but also of Academia Europaea, Associate of the Royal Academy of Science, Humanities and Fine arts de Belgique, correspondant de l' Académie royale de Médecine de Belgique, *Honorary fellow* du Royal Anthropological Institute of Great Britain and Ireland, *Foreign associate* de la Royal Society d'Afrique du Sud et Docteur *honoris causa* des Universités de Bologne, de Liége, Mons and Chicago ….

Bibliography :

- *The monkey, Africa and man,* 1983, Fayard, ISBN 2213012725
- *Origins of bipedalism* (with Brigitte Senut), 1992, CNRS, ISBN 2222046025
- *The best history of the world* (in collaboration with Hubert Reeves, Joel de Rosnay and Simonnet Dominica), 1996, Threshold, ISBN 2020505762
- *The knee Lucy: human history and the history of its history,* 1999, Odile Jacob, ISBN 2738103340
- *Pre-ambules: the first steps of Man,* 1999, Odile Jacob, ISBN 2738109365
- *Grand interview,* 2001
- *The origins of man:* reality , myth, mode () 2001, Artcom', ISBN
- *The origins of humanity* T1 and T2 (with Pascal Picq), 2002, Fayard
- *Cradles of humanity:* Beginnings to the Bronze Age, 2003, Larousse
- *Species Odyssey,* 2003 2851206044
- *Homo sapiens and the child wolf,* 2004, Flammarion, ISBN 2081627981
- Tales of a paleontologist, 2004 2738111122
- Hisotry of Man and climate change, 2006, the College de France and Fayard, ISBN 2-213-62872-6

He also made its scientific collaboration with Pierre Pelot for writing several novels prehistoric: Series, *Sub wind in the world, Gallimard, the name lost from the sun,* 1998, Denoël and *Lucy's dream,* 1997, Threshold.

Media :

- Yves Coppens anime column on France Info: Stories of Men

Awards :

- 1963 : Price Edmond Herbert
- 1969 : Andrew C. Price Bonnet
- 1973 : Gold Medal from the Emperor of Ethiopia
- 1974 : Jaffé grand prize of the Academy of Sciences
- 1975 : Scientific grand prize of the Foundation de France

- 1975 : Fourmarier medal of the Geological Society of Belgium
- 1978 : Glaxo prices
- 1982 : Silver medal from the CNRS
- **1984 : Kalinga Prize of UNESCO**
- 1984 : 27th Annual Address of the Palaeontological Association in London
- 1985 : 55th James Arthur Lecture on the Evolution of the Human Brain at the Ameican Museum of Natural Hisotry in New York
- 1985 : Augustin Frigon ninth conference of the Ecole Polytechnique de Montreal
- 1987 : Vandenbroeck medal of the Belgian Society of geology, paleontology and Hydrology.
- 1989 : Andre Duveyrier Medal of the Society of Geography.
- 1991 : Gold Medal of encouraging progress
- 2005 : Price Nonino [Italy]

Decorations :

- Commandeur de la Legion d'honneur
- Commander of the National order of Merit
- Commander of the Academic Palms
- Officer de l 'Ordre des Arts et des Lettres
- Officer de l'Ordre National du Tchad

Quotation :

The chance makes the things too well to be credible.

❑

PRESENTATION OF THE KALINGA PRIZE FOR 1984

Unesco House

Paris, 12 December 1984

Acceptance Speech of Professor Yves Coppens

Co-winner of the 1984 Kalinga Prize

Mr Director – General,

Madam Permanent Delegate of France

Mr Permanent Delegate of India

Mr Permanent Delegate of the USSR,

My dear fellow prize-winner, Igor Petryanov,

Ladies and Gentlemen,

May I first say how proud and delighted I am today to receive the Kalinga Prize, the most prestigious of awards for the popularization of science.

Some years ago, I remember looking through the pamphlet published by Unesco for the twenty-fifth anniversary of this prize and being extremely impressed by the honours list : Sir Julian Huxley, outstanding evolutionist and first Director-General of Unesco; Bertrand Russell, Nobel prize-winner for Literature, who was so keenly aware of the role of science in society; Konrad Lorenz, Nobel prize-winner for Medicine, pioneer of nature conservancy and behaviourial sciences; Jean Rostand and Sir Gavin de Beer, both in their own way poets of embryology and genetics; Alexander Oparin, insatiable in his curiosity about the origins of life; Margaret Mead, defender of the wealth and worth of each and every one of the world's cultures; Sergei Kapitza, an outstanding scientist and producer of that fine television programme which is so popular in the Soviet Union 'Ochevidnoy neveroyatnoye', which roughly translated means 'truth is stranger than fiction'.

These are only a few of the prize-winners specializing in fields related to my own (to-date, there have in fact been thirty-four Kalinga prize-winner); after mentioning their names, how can one fail to feel singularly honoured by such a distinction?

Despite the at times sensational way in which information is presented to the public, and the star system that goes with it, and despite the conviction tenaciously held-sincerely or otherwise-by many colleagues that research needs to be carried out discreetly if quality is to be maintained, I remain deeply convinced that scientists have a duty to popularize, and I have been putting this principle into practice, against heavy odds, for over a quarter of a century.

Although, generally speaking, I have not myself made approaches to the media, because this is not my function, I have responded most willingly whenever they have asked for my services and I have been in a position to give up some of my time to them. In such cases, I have always striven to maintain the strictest standards in the content of the message, for which I obviously remained solely responsible, while leaving to the media professionals, whose job it is, full freedom of choice in the way they present it.

Apart from the usual means of dissemination, such as lectures and exhibitions, films and television, records and cassettes, the press and radio, or even less common means like plays or stamps, cartoons or radio series, prehistoric parks or bus-borne travelling exhibitions, all of which I have used, it can be amusing sometimes to take advantage of circumstances which, because they are unusual, can prove to be particularly effective. I shall quote two examples of which I am proud.

In 1969, for an exhibition on the tenth anniversary of the Foundation de la Vocation, I had the skeleton of the Siberian mammoth that I had previously set up in the National Museum of Natural History, transported and reassembled on the first floor of the Maison de la Radio. The unexpected sight of this spectacular fossil in a setting devoted to art and technology, whetted the curiosity of visitors to the studios enough for them to want to make a special visit to see the other fossil animals in their permanent home. As the visitors to the Maison de la Radio-at least some of them –are apparently not regular visitors to the Museum, admissions to the Institute of Palaeontology at the Museum rose noticeably for the entire duration of the exhibition at the Maison de la Radio and stayed considerably higher for some months after the exhibition closed.

The last display case in the exhibition on 'The Origin of Man' which I organized at the Musée de I'Homme in 1976 was, naturally enough, devoted to the last link in he chain of the history of hominids, modern man, Homo sapiens sapiens. To avoid having to make an inevitably arbitrary choice between Bretons and Auvergnats, Congolese or Englishmen, Brazilians or Japanese, the young or the old, men or women, as an illustration of our fine contemporary human species, and so that each visitor could understand that the last seventy million years of history through which he had just walked was his own story, I simply covered the back panel of the tall, deep display cabinet with a mirror. It may easily be imagined how this technique made it possible to reflect back at each visitor an image – his own – of Homo sapiens sapiens which obviously implicated him personally and inextricably in the evolutionary adventure he had just been through. The 6,000 comments made in the visitors' books left open at the exhibition exits bore striking testimony – if any were needed – to the outstanding impact of this new awareness, which is indeed, in the strict sense, a reflection.

Having worked for almost my entire career in the National Museum of Natural History in Paris, where I began in 1956 as a researcher, and then in the Musée de I' Homme, where I was successively deputy director, co-director and director since 1969, I should like to take the present opportunity to say a few words about what I believe to be the importance of the concept of the museum in the spread of knowledge. I see the museum's function as being both to preserve and display a certain heritage. However, since all people, wherever they may be, should at all times have access to all knowledge – by which, taking only the example of human sciences, I mean that all people should at all times have access to others' cultures as well as their own-each nation should be able to equip itself in the medium or long term not only with museums of its own culture, as is increasingly the case, but of all other cultures of the world. Only very seldom is this the case: at present, only countries with a long-established museum tradition enjoy the privilege of being able to present their visitors with a veritable window on the world, while most

other countries have only just begun to provide themselves as best they can with museums of local, regional or, at best, national scope.

What I mean is that I shall be truly happy on the day when the Museum of Brazzaville, for instance – I say Brazzaville because I have just been there – can exhibit collections of costumes of the Nice region and traditional Breton head-dresses as well as its own costumes, just as the Musée de l'Homme and the Museum of Popular Arts and Traditions in Paris can exhibit samples of art and craftwork from the Congo alongside objects from Brittany or Nice.

Naturally, all objects belong to their home country, but a vast programme of deposit, lending and exchange ought to be set up to enable us all to understand each other a little better. In this way, moreover, all the collections of all the museuma in the world would gradually, imperceptibly, become the heritage of all mankind and the property of each and every one.

I turn to this great and fine institution, the United Nations Education, Scientific and Cultural Organization, which could adopt such a programme as one of its own.

May I take this opportunity to pay a warm public tribute to the quality of the work and achievements of Unesco, which I have known since it was founded and whose twenty-fifth anniversary was celebrated in 'my' museum, and to declare my deep esteem and admiration for its 'D.G.', as Mr Amadou-Mahtar M'Bow is affectionately called here.

I would also like to express my profound gratitude to the Foundation which bears the illustrious name of the great Kalinga Empire and reminds us of its Emperor Ashoka, as well as to Mr Bijoyanand Patnaik who took the initiative of entrusting Unesco with this prize for dialogue between scientists and the general public. I hope I can travel to India to offer my sincere thanks to the Foundation's directors at their headquarters. Finally, I thank the Association des Ecrivains scientifiques de France for having named me as France's 1984 candidate, by which I was profoundly touched and, naturally, the members of the Jury of the 1984 Kalinga Prize for the great honour they accorded me in recommending me.

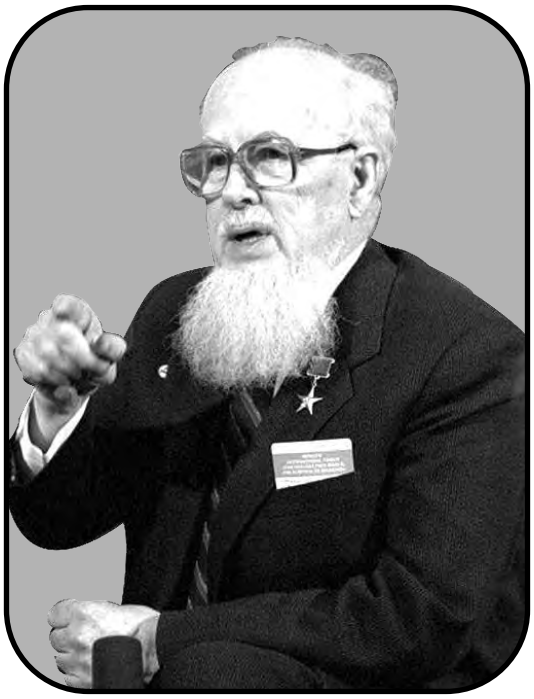
To illustrate for a few minutes the work I have done in the field of popularization, I would like to show you two film excerpts. The first is part of a television programme made in 1980 in Moscow at the request of Sergei Kapitza, 1979 Kalinga prize-winner, and broadcast in 1981. The other is a sequence from a film entitled 'Man comes on to the scene', made by Pierre Barde of Geneva, and produced by the Télévision Suisse romande and the Editel Company under the authority of Pierre Desgraupes, Etienne Lalou and Igor Barrère. This film was made in 1981 and broadcast in 1982 by the TFI channel in France and the Télévision Suisse romande.

- **The man can receive only one biological definition. One can explain the man neither by the tool, neither by the language, nor by the social organization.**
- **The law of the evolution is most significant of all the laws of the world because it governed our birth , that it governed our past, and on the whole, it controls our future.**

…Yves coppens

Kalinga Laureate for Popularization of Science – 1984

Professor Petrianov – Sokolov Igor Vasil'evich, USSR



[Born : 18th June, 1907
Died : 19th May, 1996, Moscow]

Scientific Literature was to the Literature of Popularization
What Gold Ore was to Pure Gold.

.... Igor Petrianov

Academician Igor Vasilevich Petryanov-Sokolov A Biographical Sketch

Petrianov - Sokolov, Igor V., D Chem S. Born in 1907 in Gorkiy Oblast. Russian physical chemist. Corresponding member of the Division of chemical sciences of the Russian Academy of Sciences since 23.10.1953, and academician in the Division of General & Technical Chemistry of the Academy since 1.7.1966. In 1930, he graduated from Moscow State University and began working at the L. la. Karpov Physical Chemistry Institute, becoming a division head there in 1938. Since 1947, he has been a professor at the D.I. Mendeleev Moscow Institute of Chemical Engineering. He has concentrated his work in studying the laws of filtration of aerosols. He invented new types of filtering materials. He has been editor in Head of Khimiia i zhizn (Chemistry and Life) since 1964. Recipient of the State Prize, 1941; Lenin Prize, 1966. (GSE 19, pp. 494-5.)

Academician Igor Vasilevich Petryanov-Sokolov (1907-1996) belongs to the generation of Soviet scientists who started his scientific activity during the period of the first "5 years periods" (pyatiletki). He devoted his scientific life to the development of one of the most interesting fields of science, i.e. aluvial and air dispersing systems. Among his tutors and supervisors were such outstanding scientists as A.N.Bah, J.A. Frumkin. Since 1945 he had been involved in the development of a nuclear project. At that time and for long he established scientific and personal relations with I. V. Kuztcha tok, Yu.V. Khazitox, C.N. Flyorov. Petrianov's development works made up fundamental principles for the security system protecting from nuclear hazards the staffs of the plants recycling wasted nuclear fuels. The compartment zoning and stepping protection systems were introduced for interval space protection, and later-highly effective filters and individual means for breath protection.

Igor Petrianov-Sokolov was a prominent science popularizer . He had been in charge of the "Chemistry & life" Journal for 30 years since 1964 , and also he was editor in chief of "study for school children" series , scientific editor of the society "Children's Evcyclopedia", Wrote for "Fatherland" magazine, "voice of motherland" newspaper and "monuments of the mother country" periodical. He was awarded K.I. Ushinsky Medal and Kalinga UNSCO Prize for his contribution to the science and culture popularization.

The book devoted to the memory of the great scientist Petrianov-Sokolov consists of two parts. The first part includes the scientist's own published works, and the second collections about him.

The book is scheduled to see the light for the 80th anniversary of the Institute for physics and chemistry (or Physical and chemical Institute) where Igor Vasilevich, still a student, started his working career. The academist's labour books can be believed a special symbol of his faithfulness to that institute , as it still contains the following note: "admitted to the institute in 1929".

❑

An Open Book; A Soviet Recipe for Promoting the Reading Habit UNESCO Courier, January, 1987

by Igor Petryanov-Sokolov

The chief purpose of the Book Lovers' Society of the USSR is to encourage the greatest possible number of people to become interested in books, and particularly to develop a taste for reading among children and teenagers, whose attention tends to be monopolized by television, the cinema and video. For the book and the screen are not interchangeable. The cinema dispenses readymade impressions, whereas reading demands on intensive effort of thought and imagination which has considerable formative value.

Seventeen million booklovers of everySoviet nationality, age and occupation are members of the Society, which is active in the fifteen federal republics, in the autonomous republics, the territories, the regions, and in over 4,000 cities, towns and districts. It has 194,000 cells in enterprises, factories, construction sites, agricultural co-operatives and schools.

Its role is to become a genuine instrument of exchange and dialogues between cultures through helping all kinds of people to get know the treasures of Soviet and other literatures.

The Society engages in a wide range of activities including the organization of exhibitions, literary debates, book festivals, theatrical and musical performances, and meetings with writers. By these means it seeks to develop a taste for reading and an interest in contemporary literature. Collaboration with libraries has always been an essential part of the society's work. The specialists who serve on the Society's management committees help libraries to build up their collections and inform young people in workers' hostels, factories, schools and other institutions about the existence of such library facilities.

As a contribution to the United Nations International Youth Year (1985), a children's art competition was held on the theme of "pages from favourite books', and book weeks were organized for children and teenagers.

A regular feature of the Society's activities are the annual festivals for young readers organized by local branches in each republic in collaboration with youth libraries. Examples include a major children's book festival in Lithuania, a festival organized by the school sections of the Booklovers' Society of Armenia, a Young Booklover's Rally in Azerbaijan, and the Schools Literary Festival in the Russian SFSR. A Booklovers' Day and Book Festival held in Moscow in 1985 were a great success.

It is not unusual for booklovers to give practical expressions of solidarity with readers in other republics. Ukrainian readers organized a collection of books for libraries in Gazli, a town in Uzbekistan which was destroyed in an earthquake. Libraries in Tajikistan, which also suffered in the earthquake, similarly received gifts of books.

The Society also acts as a link between authors, publishers, distributors and book buyers. Travelling libraries on boats or in buses go all over the country, taking collections of the latest books to

isolated communities. One specially equipped "bibliobus' for readers in the town of Neriungri in Yakutia caters for a nearby coalmine, a prefabricated material factory and building sites. In the Ashkabad region (Turkmen SSR) booklovers have set up small libraries on ships and airliners. They also send books to day schools and boarding schools, hospitals, village libraries and the sites of major public works projects. The delivery of parcels of books to construction workers on the second Trans-Siberian railway was given top priority.

Most booklovers' circles also try to meet the ever greater demand from young factory executives for scientific and technical literature dealing with their branch of activity. Young readers are also interested in book preservation and restoration – in a single year, 500,000 volumes were restored in more than 400 bookbinding clubs in schools in the Cherkassy region (Ukrainina SSR). Many clubs draw on the teacing resources of museums, and are introducing a growing number of young workers, kolkhoz members, students and schoolchildren to literature, art, history and the sciences. One example of this trend is the literary and musical circle accommodated in the former home, now a museum, of the novelist Constaqtine Fedin at Saratov (Russian SFSR).

The Society publishes bibliographical works, literary criticism, biographies of famous bibliophiles and collectors, and descriptions of great libraries. It publishes more than 300 titles a year, mainly literary works and art books, with a print run of over a million copies. The Society has contributed to the erection of monuments to great writers and to the creation of book museums and book centres in localities which have no public library. It has, for example, helped to resotre the monument to Nikolai Gogol at Poltava in the Ukrainian SSR, and to the opening of the Mikhail Lermontov Museum at Taman, in the Caucasus.

The Society's central directorate establishes and maintains close contacts with similar associations in the other Socialist countries and in capitalist countries which have cultural relations with the USSR. International meetings and cooperation and exchange agreements in the fields of books and publishing contribute to the enrichment of knowledge, the spread of humanitarian ideals and the strengthening of friendship between peoples.

Photo: The Booklovers' Society of the USSR marked the 40th anniversary of Unesco with this bookplate design representing a globe within the pages of a book.

Photo: Two examples of calligraphy from the Soviet Union. Above, a seal designed in 1919 by Sergei Checkhonin for the Department of Visual Art of the People's Commissariat of Education. Right, a 1913 lithograph produced fby Kazimir Malevich for the cover of a poetry anthology, The Three.

Photo: Above, Poems by Osip Mandelstam (1979), a calligraphic study in Indian ink by Alexander Yulikov (born 1943), which was shown at an exhibition on the art of calligraphy organized at Unesco Headquarters in October 1986 by the USSR National Commission for Unesco and the Artists' Union of the USSR.

❑

PRESENTATION OF THE KALINGA PRIZE FOR 1984

Unesco House

Paris, 12 December 1984

Acceptance Speech of Academician Igor V. Petryanov-Sokolov

Co-winner of the Kalinga Prize for 1984

Mr. Director-General,

Ladies and Gentleman,

A great many years have gone by since the day I first heard of the Kalinga Prize.

I can still quite distinctly remember how I was struck by its astonishing poetic romanticism, its lofty humanism and its very special social significance. People must understand one another clearly and precisely, and understand what they are doing. For this, they need an intelligible account, which is what the popularization of science is.

And then, I must confess, I was suddenly taken with the wish for the unthinkable and utterly hopeless to happen and for me to become the happy possessor of an award with such a beautiful name. And now my impossible dream has come true: my modest services have received such appreciation and recognition, and all of a sudden I am, for the first time, upon the stage of Unesco, holding in my hands the confirmation that my dream has become a reality.

I am fully conscious of the fact that this distinguished international award first of all expresses recognition of the great achievments of the Soviet Union in the noble cause of popularizing knowledge.

I wish to thank the members of the international jury and the administration of Unesco for their high appraisal of my work.

I should like to recall here with gratitude the names of two friends of mine who have helped me in various ways-Sergei Kapitza, an earlier recipient of the Kalinga Prize, and Petr Basmanov, my old friend and colleague, who many yeas ago produced with me for the first time in the Soviet Union a major popular science television broadcast in my immediate field of specialization, the protection of nature and human health.

Of course, I am, unfortunately, unable to mention even the names of my friends and colleagues who worked with me to bring out the popular-science editions which have won such wide acclaim.

These are the popular-science magazine of the USSR Academy of Sciences “Chemistry and Life” (Circulation 300,000); the series “Men of Science for School children”, consisting of more than forty booklets written by leading academician scientists and running to not less than 200,000 copies. Then, there is the popular science publication on the preservation of historic and cultural monuments in the

USSR-the almanac “Memorials of the Motherland”, with a circulation of 50,000; and the popular-science series of books of the USSR Academy of Sciences, with more than a thousand titles running to some 10,000 copies each.

I am proud to have been associated with the creation of the Soviet Children’s Encyclopaedia in Rusian, and editions in Georgian and Ukrainian. The print run of each edition exceeded 300,000 copies. The Encyclopaedia is of great importance for the education of the new generation of Soviet youth.

I must also say I am proud that my modest services to the popularization of knowledge have been specially recognized in my country in that I was elected Chairman of the All-Union Voluntary Society of Booklovers with its membership of over 16 million. the Society counts among its chief tasks the production and distribution of popular-science literature, the most perfect form of scientific information.

Ladies and gentlemen, I have devoted a considerable part of my life to popularizing scientific knowledge. I consider this work to be a duty for every scientist that is no less important than his own research work. I am firmly convinced that any scientific achievement can only be regarded as complete when it is brought within the reach of all. Science and knowledge cannot develop without information, but this component, which today is most important, is unfortunately distorted.

There are now in the world already more than 300,000 specialized scientific and technological periodicals, and the figure is constanly rising. In addition to this, no less than 50,000 monographs and books are published annually.

The concern of researchers to maintain their scientific standing and get in first, as it were, forces them to publish their findings hurriedly, inevitably in the form of fragmentary and partial scientific papers. The usability of the information contained in them is negligible. People cannot find their way about in them. Only the author can summarize and make into a unified whole a series of his own publications.

The present system of passing on scientific information is entering a blind alley. This makes it seesntial to seek a new form of information, without which the progress and development of society would be impossible.

The scientific publication of the future must cover some completed research in a particular branch of science. It must include only verified and proven data and a generalizing theory, together with definite, long-term ways of developing the area of science theory, together with definite, long-term ways of developing the area of science with which the author is converned.

In that case, the exposition is bound to be more interesting, explicit and accessible, and not just for narrow specialists. And scientific information in that form will certainly come closer to genuinely popular science.

Popular science literature has nowadays become not only a basic source of knowledge for all those wanting to know more about science, but also a source of usable scientific information for specialists.

Errors, distortions of scientific facts or an inaccurate and mistaken presentation in a popular science book or article are very much more dangerous than mistakes in a scientific article, where they cannot do much harm. Since articles in specialized journals are now read by only a handful of people, it seems to me that a society that cares about the development of science and technology and about improving culture and well-being must in fact give special attention to popular science literature as a basic form of information for the general public.

Popular science books must be written by the foremost scientists. Let us not forget that Faraday wrote his own chemical history of the candle, Lomonosov his encornium of glass, Timiryazev his life of plants and Vavilov his book on the eye and the sun.

The author of a popular science book must be a master in his field, and only this can ensure that the account given is both highly reliable and understandable. Every scientist should consider it an honour and duty to write a popular science book.

Let me make a comparision. If the existing way of transferring scientific information in the form of scientific and technological journals and monographs is likened to a gold-bearing ore, then popular science literature is the precious metal.

The popularization of science does much to extend scientific and technological knowledge in what is termed general education. This is a most noble activity which makes it possible to define more clearly the merits and the limitations of new knowledge. Such activity makes a practical contribution to international co-operation and mutual understanding among peoples. The further improvement of knowledge and its ever broader application inall areas of the life of society open up new horizons for the popularizaiton of science, and I must say that this outlook is very promising.

I am particularly gratified to note that Unesco is making vast resources available to mankind in the realm of intellectual activity. By spreading education, science and culture, it is bringing a variety of complex knowledge and skills within reach of more and more people and this, in turn, is leading to a broadening of human initiative to the exchange of values and the establishment of ever closer and vitally important links. We are confident that Unesco's activity will be further developed despite those actions of a not so very popular kind that are now aimed at undermining established forms of multilateral co-operation and at preventing the future progressive development of this popular Organization. Harnessing the huge present and future potential of science and technology, securing the broad and equitable participation of every nation in global development, and enabling people to overcome the difficult problems of the present-day world depend ultimately on the creative potential and collective efforts of all peoples fon this earth.

Unesco's activities serve precisely this noble task and it is for this very reason that the Organization enjoys such widespread popularity. I should like in conclusion to voice my confidence that Unesco will continue to serve the noble ideals of mankind. May I once more thank you sincerely for honouring me so greatly in this way.

Kalinga Laureate for Popularization of Science – 1985

Sir Peter Brian Medawar, United Kingdom
Nobel Laureate in Physiology or Medicine - 1960

[Born: 28th February, 1915, Petropolis, Rio de Janeiro, Brazil
Died : 2nd October, 1987, London, United Kingdom]

I can not give any scientist of any age better advice than this: the intensity of a conviction that a hypothesis is true has no bearing over whether it is true or not.

…Peter Medawar

If Politics is the art of the Possible, research is surely the art of the soluble. Both are immensely Practical minded affairs .

...Peter Medawar

Peter Medawar
A Brief Biographical Sketch

Born	**:**	February 28, 1915 Rio de Janeiro, Brazil
Died	:	October 2, 1987 (aged 72) London, United Kingdom
Notable Prizes	**:**	Nobel Prize in Physiology or Medicine (1960), **Kalinga Prize, 1985**

Sir Peter Brian Medawar (February 28, 1915 – October 2, 1987) was a Briazilian – born British scientist best known for his work on how the immune system rejects or accepts tissue transplants. He was co-winner of the 1960 Nobel Prize in Physiology or Medicine with Sir Frank Macfarlane Burnet.

Early Years :

Medawar was born on February 28, 1915, in Rio de Janeiro of a British mother and a Lebanese father.

Early Research :

His involvement with what became transplant research began during World War-II, when he investigated possible improvements in skin grafts. It became focused in 1949, when Burnet advanced the hypothesis that during embryonic life and immediately after birth, cells gradually acquire the ability to distinguish between their own tissue substances on the one hand and unwanted cells and foreign material on the other.

Outcome of Research :

Medawar was awarded his Nobel Prize in 1960 with Burnet for their work in tissue grafting which is the basis of organ transplants, and their discovery of acquired immunological tolerance. This work was used in dealing with skin grafts required after burns. Medawar's work resulted in a shift of emphasis in the science of immunology from one that attempts to deal with the fully developed immunity mechanism to one that attempts to alter the immunity mechanism itself, as in the attempt to suppress the body's rejection of organ transplants.

Achievements :

Medawar was professor of zoology at the University of Birmingham (1947-51) and University College London (1951-62). In 1962 he was appointed director of the National Institute for Medical Research, and became professor of experimental medicine at the Royal Institution (1977-83), and president of the Royal Postgraduate Medical School (1981-87). Medawar was a scientist of great inventiveness who was interested in many other subjects including opera, philosophy and cricket.

In addition to his accomplishments as a scientist, he also wrote on the practice and philosophy of science. His books include, *The Art of the Soluble,* a book of essays, some later reprinted in *Pluto's Republic, Advice to a Young Scientist, Aristotle to Zoos* (with his wife Jean Shinglewood Taylor), *The Life Science,* and his last, in 1986, *Memoirs of a Thinking Radish,* a brief *autobiography.*

He was knighted in 1965 and awarded the Order of Merit in 1981. While attending the annual British Association meeting in 1969 he suffered a stroke (brain haemorrhage) whilst reading the lesson at Exeter Cathedral. It could be argued that Medawar's failing health had repercussions for medical science as well as for relations between the scientific community and government. Prior to his failing health, Medawar was considered by many to be one of the United Kingdom's most influential scientists, particularly in the medico-biological field.

After the impairment of his speech and movement Medawar, with his wife's help, reorganised his life and continued to write and do research though on a greatly restricted scale. However, more haemorrhages followed and in 1987 Medawar died. He is buried – as is his wife Jean (1913-2005) – at Alfriston in East Sussex. Jean Medawar's obituary can be found at http://www.findarticles.com /p/articles/mi_qn4158/is_20050512/ai_n14623720

External links :

- Biography from Sci-Quest Journal (http://www.geocities.com/CapeCanaveral/2612/life.htm)
- Magdalen College Oxford, biography of Peter Medawar (http://www.magd.ox.ac.uk/history/nobel_medawar.shtml)
- Biography on Nobel Prize website (http://nobelprize.org/medicine/laureates/1960/medawar-bio.html)

Source :

http://en.wikipedia.org/wiki/Peter_Medawar

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STORY - PETER MEDAWAR

Peter Medawar, 1915-1987 :

Even in 1915, it was a small world for Peter Medawar. Peter's father was from Lebanon, but moved to England to seek his fortune and marry an Englishwoman. He did marry and after their marriage, the couple moved to Rio de Janeiro, Brazil, where Peter's father became a salesman for a dental supply company out of England. Peter was born in Rio, but nonetheless was declared a citizen of England.

Childhood Interests :

Before entering school, Peter Medawar learned Portuguese, the first lanuguage of Brazil, because school was taught in that language. He recalls of his mathematics teacher that she "considered it her business to teach us addition, subtraction, and the like, and she jolly well did." A main childhood interest of Peter was reading comic books. He and his brother had quite a collection. Another perhaps surprising interest was opera. Peter fell in love with the gramophone, the forerunner of today's record player or CD player. Due to the kinds of music his parents played in the house, he acquired a love for opera, even as a child. He would save his pocket money for weeks, in order to buy a record. He enjoyed pretending to be an orchestra conductor in front of a mirror.

Most of Peter's free time as a child was spent with his brother on Copacabana Beach. He marvels that he did not catch polio, which afflicted many childrenin in his neighborhood. His very own brother was crippled for life by the disease. Peter recalls how the town's sewers emptied directly onto the beach, and the children played around huge stagnant pools of sewage.

School Experiences :

While Peter was still in grade school, the family moved back to England and lived in an apartment in suburban London. Soon thereafter, his mother and father returned to Rio and left Peter and his brother in an English boarding school. Many people think of English boarding schools as an elite educational experience, preparing students for premier English colleges such as Oxford or Cambridge. In Peter Medawar's day, however, many such boarding schools had low standards, poorly qualified teachers, and run-down facilities. The students came from average families, not wealth . Such was the case with Peter and his boarding school.

His favorite teacher was a middle-aged, bald, language teacher who loved drinking his ale and was an avid football (soccer) fan. Reading and writing quickly became major activities for Peter. In later years, Peter became famous for the quality of his writing, not only in his scientific papers, but also in his essays on a variety of topics.

When he was thirteen, Peter's mother thought he should attend a "public" boarding school. Such schools is England were designed to train boys for leadership in the home civil service or for colonial administration and the foreign service. Peter hated his experience at the public boarding school. The school building itself had a prison-block design. The people were snobbish. Every boy had to take a cold bath every morning, even on the coldest days. The bathrooms were scrawled with dirty graffiti. Whippings were common. A great deal of authority was given to the boys themselves, who

abused the privilege by bullying the boys with lesser authority. In addition to the usual abuse, Peter endured further harassment because his Middle Eastern facial features led others to assume that he was Jewish.

Peter was also disappointed because of his lack of athletic skills. If a boy did not have the talent to do well in sports, he was banished from sports and ridiculed around school. Just as today, a lot of emphasis was put on students' athletic talents when it came to winning approval and popularity.

Peter did encounter a teacher he admired – a biology teacher who inspired two other boys at the school to become university professors. He was a crude and aggressive man who was hirea, Peter thought, to discredit science so that students would become more adept in other subjects which were deemed more relevant fo: leadership and government service.

So why did Peter, and the other boys too, like this man? Maybe it was because he did not put on airs, as did so many other teachers. Peter never figured out why he and the other students were inspired by this teacher. In any case, Peter quickly realized that he wanted to study biology in college.

Oxford Education :

Peter Medawar applied for a scholarship to Oxford, but failed. He did, however, score well enough on the tests to be admitted as a "commoner," which is what the British call the regular undergraduate student. A new and much more civilized world opened for Peter at Oxford. At Oxford, students are grouped and housed as social units called "colleges." His college was Magdalen. Peter did not fit in well with many of those in Magdalen, but he did get along well with students who shared his interests in Magdalen, but he did get along well with students who shared his interests in music and biology. The administrators of Magdalen College did not recruit students for their scholarship, but rather they wanted "regular guys" who would bring distinction to the college through sports and leadership activities. Thus, Peter encountered far too many of the same types of social snobs that he had lived with at boarding school. Despite the situation, Peter loved Oxford, for it was full of stimulating people of substance and high achievement.

In those days, Oxford had a 1:1 student teacher ratio. Teaching was administered through one on one tutoring . Students met their tutor once each week, while studying, completing lab and learning exercies, and writing papers between sessions. The tutor did not "lecture," nor provide factual information. The tutor's role was to guide students to the right books and papers, to set standards, to inspire a love for the subject, and to judge the adequacy of student achievement. Tutors had to be generalists in their subjects. Biology students, for example, did not go to a physiologist to learn physiology, an anatomist to learn anatomy, or a geneticist to learn genetics, etc. One tutor guided the learning in all aspects and specialties. Peter was lucky enough to have as one of his tutors, John Young, a famous neurobiologist, who helped him appreciate the breadth and inter relatedness of all biology. Shortly after graduation, Peter himself became a tutor and found it to be "about the hardest work" he'd ever done.

As much as Peter generally enjoyed his tutoring experiences, he was quick to point out the problems. He summarized the problems as follows: "Some tutors are self-indulgent."

Peter's Research and Studies : Each student at Oxford negotiated with his tutor a program of study, which included the level of standard to which the student would be held. Standards could be set low enough to allow students to focus on partying and social life (a "pass" degree) or set as high as to require high scores on rigorous examinations (leading to a degree labeled First, Second, or Third).

Peter Medawar graduated with a First. Because his interest was well kindled in zoology, he stayed on as a graduate student at Oxford. He plunged into research on embryos, using the then revolutionary technique of culturing cells. His first studies identified a compound in malt extract that inhibited connective tissue cell; in culture. He showed the first draft of his manuscript describing the research to Howard Florey, the discoverer of penicillin. Florey pulled no punches in denouncing the paper, saying that "it sounds more like philosophy than science." Despite the criticism, Florey encouraged him to fix the paper and to pursue his line of research, putting him in touch with chemists with whom he could consult to learn more about the mysterious inhibitory compound. Peter never identified the chemical nature of this compound. In the meantime, he did use the malt extract to study the mathematics that describe growth of cell in culture.

While conducting his research, Peter also worked in Florey's laboratory, where everyone studied wound and burn healing to aid in the World War II effort in Britain. At that time, people with severe burns were kept alive with blood transfusions and sulfa drugs to combat infections. This created a problem as the burned tissue would fall away and leave in its place raw areas that were very vulnerable to infection. Peter tested a variety of antibacterial substances, finding that some of the sulfa drugs were effective when applied as a powder to the raw areas. In a tissue culture, one sulfa drug's crystals actually enhanced the ability of epithelial cells to spread, using the crystals as a support "pole" for tent-like coverings. Thus, this drug not only reduced infections but also accelerated the covering of raw burn areas by new skin growth.

These war wound experiences also shaped Peter's future research. He became intrigued with the fact that skin grafts only worked if the grafted skin came from the same person receiving the graft. Somehow, the body could recognize alien tissue and would not accept it. How? He took on this problem as his "duty and pleasure" to investigate. As World War II continued in Europe, he applied for and received a grant to study the issue in a surgical unit where there were plenty of patients with skin wounds needing grafts.

One of his first clues was the observation that a second graft of "foreign" skin did not last as long as the first one. This suggested that the body had some kind of memory of the first graft experience. He and his colleague, Tom Gibson, published a paper on the data and concluded that the body has a mechanism that resists alien tissue, much like the mechanism by which the body resists other foreign invaders, such as bacteria, viruses, and parasites. The mechanism allows the body to adapt to or reject foreign intrusion. Moreover, the resistance system can retain a residual memory and respond even more vigorously at the second time of exposure.

Peter then embarked on a large program involving animal testing of skin-graft rejection. He cut and stained tissue samples taken from the grafts and observed cellular changes occurring at various

stages of graft rejection . Because the war was in full sway, Peter had little help. He was responsible for all of the animal feeding, surgeries, nursing care, and laboratory work. He felt guilty if he did less, though he took some comfort from the fact that he was helping to develop treatments for war injuries. He was also proud to be teaching medical students who would become the doctors saving lives during the war. He acquired the habit of working long days and bringing home a briefcase of documents to read before the next morning.

Peter's most important work was to demonstrate that the rejection of donor grafts was due to an immunological reaction and that tolerance could be built up by injections into embryos. Thus was born the idea of acquired immunological tolerance, an idea that is still spawning new research to this day, because how this tolerance develops is still not fully understood. The body's capacity for reacting to foreign proteins can be reduced by repeated exposure to the protein, preferably in small, graded amounts. Applications of Peter Medawar's research include the common practice of treating allergies with allergy shots and of reducing rejection of tissue transplants. Although most of his work was immediately accepted and appreciated by his peers, Peter is often quoted for the famous quip:

The human mind treats a new idea the way the body treats a strange protein.

For his important discoveries, Peter was awarded the Nobel Prize in 1960. It was his research on tissue transplantation which eventually helped make organ transplants possible.

His book, "Advice to a Young Scientist," has been widely read and is still available at http://www.opengroup.com/sabooks/046/0465000924.shtml

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- http.//www.aub.edu.lb/alumni/ssc/life.htm **Biographical sketch**
- http://www.magd.ox.ac.uk/alumni/medawar.html **Biographical sketch**
- http://www.the-scientist.com/yr1988/jan/peter_p13_880125.html - **In Memoriam Testimonial**

Today the world Changes so quickly that in growing up we take leave not just of youth but of the world we were young in . I suppose we all realize the degree to which fear and resentment of what is new is really a lament for the memories of our childhood.

...Peter Medawar

Kalinga Laureate for Popularization of Science - 1986

Dr. Nikolay Gennadiyevich Basov, USSR
Nobel Laureate in Physics - 1964

[Born : 14th December, 1922, Voromezh, USSR
Died : 1st July, 2001]

Nicolay G. Basov
The Nobel Prize in Physics 1964
Biography

Nikolay Gennadiyevich Basov was born on December, 14, 1922 in the small town of Usman near Voronezh, the son of Gennady Fedorovich Basov and Zinaida Andreevna Molchanova. His father was a professor of the Voronezh Forest Institute and devoted his life to investigation of the influence of forest belts on underground waters and on surface drainage.

After finishing secondary school in 1941 in Voronezh Basov was called up for military service and directed to the Kuibyshev Military Medical Academy. In 1943 he left the Academy with the qualification of a military doctor's assistant. He served in the Soviet Army and took part in the Second World War in the area of the First Ukranian Front. In December 1945, he was demobilized and entered the Moscow Institute of Physical Engineers where he studied theoretical and experimental physics.

From 1950 to 1953 he was a postgraduate student of the Moscow Institute of Physical Engineers. At that time, Basov was working on his thesis at the P.N. Lebedev Physical Institute of the Academy of Sciences, U.S.S.R., under the guidance of Professor M.A. Leontovich and Professor A.M. Prochorov.

In 1950 Basov joined the P.N. Lebedev Physical Institute, where at present he is vicedirector and head of the laboratory of quantum radiophysics. He is also a professor of the department of soild-state physics at the Moscow Institute of Physical Engineers.

In 1952 Dr. Basov began to work in the field of quantum radiophysics. He made various attempts (firstly, theoretical and then experimental) to design and build oscillators (together with A.M. Prochorov). In 1956 he defended his doctoral thesis on the theme "A Molecular Oscillator", which summed up the theoretical and experimental works on creation of a molecular oscillator utilizing an ammonia beam.

In 1955 Basov organized a group for the investigation of the frequency stability of molecular oscillators. Together with his pupils and collaborators A.N. Oraevsky, V.V. Nikitin, G.M. Strakhovsky, V.S. Zuev and others, Dr Basov studied the dependence of the oscillator frequency on different parameters for a series of ammonia spectral lines, proposed methods of increasing the frequency stability by means of slowing down molecules, proposed methods of producing slow molecules, investigated the operation of oscillators with resonators in series, realized phase stabilization of klystron frequency by means of molecular oscillators, studied transition processes in molecular oscillators, and designed an oscillator utilizing a beam of deuterium ammonia. In the result of these investigations the oscillators with a frequency stability of 10^{-} have been realized in 1962.

In 1957 Basov started to work on the design and construction of quantum oscillators in the optical range. A group of theorists and research workers began to study the possibilities for realization of quantum oscillators by means of semiconductors, and after A. Javan's proposal, the possibility of their realization in the gas media was also investigated. In 1958 together with B.M. Vul and Yu.M. Popov he investigated the conditions for production of states with a negative temperature in semiconductors,

and suggested utilization of a pulse breakdown for that purpose. In 1961 together with O.N. Krokhin and Yu.M. Popov, Basov proposed three different methods for the obtaining of a negative temperature state in semiconductors in the presence of direct and indirect transitions (optical excitation, utilization of a beam of fast electrons and injection of carriers through a degenerated p-n Junction).

As a result of a cooperative effort with B.M. Vul and collaborators the injection semiconductor lasers utilizing crystals of gallium arsenide were made at the beginning of 1963.

In 1964 semiconductor lasers with electronic excitation have been made (together with O.V. Bogdankevich and A.N. Devyatkov); and somewhat later, lasers with optical excitation were constructed (together with A.Z.. Grasiuk and V.A. Katulin). For these achievements a group of scientists of Lebedev Physical Institute was awarded the Lenin Prize for 1964.

Beginning from 1961 Dr. Basov (together with V.S. Zuev, P.G. Krinkov, V.S. Lctokhov et al.) carried out theoretical and experimental research in the field of powerful lasers. There have been found the ways of obtaining powerful short laser pulses. The nature of appearance of such pulses in quantum oscillators and their propagation in quantum amplifiers have been investigated. This work resulted in the development of high-power single-pulse Nd-glass lasers with 30 J energy and $2*10^{-11}$ sec pulse duration (in 1968 together with P.G. Krinkov, Yu.V. Senatsky et al.) and multichannel lasers with energy 103 J within 10^{-9} sec (in 1971 in collaboration with G.V. Sklizkov et al.)

In 1962 N. Basov and O.N. Krokhin investigated the possibility of laser radiation usage for the obtaining of thermonuclear plasmas. In 1968 Basov and his associates (P.G. Kriukov, Yu.V. Senatsky, S.D. Zakharov) have succeeded in observing for the first time neutron emission in the laser-produced deuterium plasmas. The spectra of multicharged ions CaXVI, FeXXIII, K XIX and others have also been observed (together with O.N. Krokhin, S.L. Mandelshtam, G.V. Sklizkov). There has been developed a theory of picosecond pulse formation (together with V.S. Letokhov). In the same year Basov and his associate A.N. Oraevsky propsed a method of the thermal laser excitation. Further theoretical considerations of this method by Basov, A.N. Oraevsky and V.A. Sheglov encouraged the development of the so called gasdynamic lasers.

In 1963 Dr. Basov and his colleagues (V.V.Nikitin, Yu.M.Popov. V.N. Morozov) began to work in the field of optoelectronics. They developed in 1967 a number of fast-operating logic elements on the basis of diode lasers. At present a logic structure of the multichannel optoelectronic systems producing 10^{10} operations per second for the optical data processing is under the development.

The studies of the radiation of the condensed rare gases under the action of a powerful electron beam have been initiated in 1966 by Basov and his collaborators (V.A. Danilychev, Yu.M. Popov), and they were the first to obtain in 1970 the laser emission in the vaccum ultraviolet range.

In 1968 Basov (in cooperation with O.V. Bogdankevich and A.S. Nasibov) made a proposal for a laser projection TV. About the same time Dr. Basov (together with V.V. Nikitin) began the studies of the frequency standard in the optical range (on the basis of gas lasers). In 1970 they succeeded in realizing a gas laser stabilized in the methane absorption line with frequency stability 10^{-11}.

In 1969 Basov (together with E.M. Belenov and V.V. Nikitin) hypothesized that to obtain the frequency standards with the stability $10^{-12} – 10^{-13}$ a ring laser can be used with a nonlinear absorption cell.

A large contribution has been made by Dr. Basov to the field of chemical lasers. In 1970 under his guidance an original chemical laser was achieved which operates on a mixture of deuterium, F and CO_2 at the atmospheric pressure. In the same year Basov (in cooperation with E.M. Belenov, V.A.

Danilychev and A.F.Suchkov) proposed and developed experimentally an elion (electrical pumping of ionized compressed gases) method of gaslaser excitation. Using this method for a CO_2 and N_2 mixture compressed to 25 atm., they achieved a great increase of power of the gas laser volume unit compared to the typical low pressure CO_2 lasers.

In the end of 1970 Basov (together with E.P. Markin, A.N. Oraevsky, A.V. Pankratov) presented experimental evidence for the stimulation of chemical reactions by the infrared laser radiation.

In 1959 Dr. Basov was awarded the Lenin Prize together with A.M. Prochorov for the investigation leading to the creation of molecular oscillators and paramagnetic amplifiers. In 1962 Dr. Basov was elected a corresponding member of the Academy of Sciences of the U.S.S.R.; in 1966, a member of the Academy; in 1967, a member of the Presidium of the Academy of Sciences of the U.S.S.R., and a foreign member of the German Academy of Sciences in Berlin; and in 1971, a foreign member of the German Academy "Leopoldina".

Dr. Basov is Editor-in-chief of the Soviet scientific journals Priroda. (Nature) and "Kvantovaya Elektornika" (Quantum Electronics); he is also a member of the Editorial Board of "Ii Nuovo Cimento".

In 1970 Dr. Basov was awarded the rank of Hero of Socialist Labour. Dr. Basov is a member of the Soviet Committee of the Defence of Peace and a member of the World Peace Council.

Nikolai Basov married in 1950. His wife, Ksenia Tikhonovna Basova, is also a physicist and is with the Department of General Physcis of the Moscow Institute of Physical Engineers. They have two sons:Gennady (born 1954) and Dmitry (born 1963).

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Nicolay G. Basov died on July 1, 2001.

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BASOV, NICOLAI GENNEDIYEVICH
Soviet Physicist
A brief Profile of his work & life

While studying the interactions between incident electromagnetic waves and matter, Basov conceived of a method for amplifying the original waves by having atoms or molecules release identical waves, in phase, at a multiplying rate. This method led to the invention by C.H. Townes of the maser, a device for microwave amplification by the stimulated emission of radiation. Subsequently, amplification of visible, radiation, the laser, was achieved. The New field known as quantum electronics – electronics with quantum mechanics having a key role-quickly grew out of these achievements. For his fundamental studies in this area, Basov received the 1964 Nobel Prize in physics, which he shared with his co-worker. A. M. Prochorov and with Townes of the United States.

In 1917 Einstein conducted a thermodynamic study of the nature of the interaction between electromagnetic radiation and atoms or molecules. Previously, similar analyses had indicated that amplification could never be produced by such interactions without violating the second law of thermodynamics. This law states that a process in which the entropy, the degree of disorder, of an isolated system decreases could not occur. However, Einstein followed thermodynamic reasoning further and derived a relationship governing the rate of change of electromagnetic radiation confined in a region where it interacts with a group of molecules. The first two terms of his equation represented the known processes of absorption and spontaneous energy release. Einstein discovered that the third and last term represented an unknown type of emission from an upper energy state produced by the mere presence of the radiation intensity. This was called stimulated emission.

For equilibrium at any positive temperature T, Boltzmann's law, expressed in the equation below, relates the probabilities N_A and N_B of electrons in the quantum states A and B.

$$N_B = N_{A^e} - \frac{(E_B - E_A)}{\kappa T}$$

Here $E_B - E_A$ is the energy difference between the states under consideration, and the state B is a higher energy state than A; is Boltzmann's constant; and T is the absolute temperature. This law requires $N_B < N_A$ at any positive absolute temperature.Einstein's discovery showed that if $N_B > N_A$, the rate of change of radiation in the system would always be positive. Thus the incident radiation would become amplified. The condition $N_B > N_A$ was termed population inversion and became known as a condition of negative temperature, since in Boltzmann's law it may be obtained by assuming a negative absolute temperature.

Basov reasoned that population inversion was a practical means for amplification of electromagnetic radiation. He realized that, in order to make an assembly of molecules or atoms amplify, the equilibrium of the electrons within the energy levels must be disturbed. The probability of finding electrons in higher energy levels must be greater than that of finding them in the lower levels. He further reasoned that the crucial requirement was to produce positive feedback of the incoming waves to force the electrons to the higher level by some type of resonant circuit. It was also necessary to ensure that the gain in energy by the stimulated transition from the higher to the lower

level was greater than the circuit losses. If these conditions were satisfied, Basov indicated, then a mass of certain type could be assembled that would be sensitive to incoming waves. Electrons within the mass would be excited into a higher energy level, producing a population inversion, or the so-called condition of negative temperature. The electrons would simultaneously fall back into the original levels, releasing waves identical to those that first entered.

A successful device was first produced in 1954 at Columbia University by Townes, who found a way to assemble ammonia molecules in a resonant chamber, such that when a radio wave at 24,000 megahertz in the radar or microwave region, encountered the chamber, additional waves of that frequency were produced by the ammonia molecules. This produced a cascade effect in the chamber, resulting in an enormous amplification of the original wave and a confirmation of Basov's predictions, In July 1960 T.H. Maiman announced the construction of a device employing the maser principle for light waves. It consisted of a long crystal of synthetic ruby enclosed in a spiral flashtube of xenon. Flashes of light from the xenon excited the electrons in the crystal and produced a population inversion. When these electrons dropped back to their ground state, they emitted a form of visible radiation never seen before. The light wavelengths, all of the same frequency, were precisely in step – a condition known as temporal and spatial coherency. The extraordinary properties of coherent light were quickly put to a wide variety of tasks, including delicate surgical operations where burning is needed, measurements, and precise signaling. In practice the maser and laser stimulated emission may be obtained from the lowest radio frequencies to the ultraviolet region.

Basov joined the Lebedev Institute, Moscow, in 1948 as a laboratory assistant. This was 2 years before he graduated from the Moscow Engineering and Physics Institute. In 1958 he became a deputy director of the Lebedev Institute. He became a member of the Communist party in 1951 and received the Lenin Prize in 1959 for the work described above. The degree of doctor of physical mathematical sciences, more advanced than the American Ph.D., was earned in 1957. He was elected a corresponding member of the Soviet Academy of Sciences in 1962, one step lower than academician.

Kalinga Laureate for Popularization of Science – 1986

Dr. David Takayoshi Suzuki, Canada

[Born : 24th March, 1936…]

- "The human brain now holds the key to our future. We have to recall the image of the planet from out space: a single entity in which air, water and continents are interconnected . That is our home."
- "Whatever we do to nature, we do to ourselves"

...David Suzuki

David Suzuki
A Biographical Profile

As a child growing up in British Columbia, David Suzuki was told by his father, "You have to be ten times better than other Canadians in everything you do, because if you are only as good as they are you'll lose out every time". Suzuki learned that lesson and has spent most of his life being better at science, broadcasting, writing and teaching than most other Canadians.

Dr. David T. Suzuki (born March 24,1936) is a Vancouver – born Canadian geneticist who has attained prominence as a science broadcaster and an environmental activist. He received his BA from Amherst College in Massachusetts in 1958 and his PhD from the University of Chicago in 1961. Since 1960, Suzuki has been hosting The Nature of Things, one of the earliest shows of the Canadian Broadcasting Corporation after it became national , which has aired in nearly 50 countries worldwide. He was also the host of the PBS series The Secret of Life. He has been the Genetics Professor at the University of British Columbia for 30 years (1969 until his retirement in 2001), and has since been professor emeritus at a university research institute. A Planet for the Taking, a 1985 hit series, averaged over 1.8 million viewers per episode and earned him a United Nations Environment Program Medal in 1987. Suzuki is the author of over 15 books for both adults and children, including Genethics, Wisdom of the Elders, Inventing the Future, and the Looking At series, a best-selling children's science books. Early in his research career he studied genetics, using the popular model organism Drosophila melanogaster (fruit flies). To be able to use his initials in naming any new genes he found, he studied Drosophila temperature- sensitive phenotypes (DTS). (As he jokingly noted at a lecture at Johns Hopkins University, the only alternative was darn tough skin.) He gained several international awards for his research into these mutations. He was presented with the UNESCO Kalinga Prize for science writing in 1986. A third-generation Japanese-Canadian ("Canadian Sansei"), Suzuki and his family suffered internment in British Columbia during the Second World War from when he was six until after the war ended. Suzuki married Setsuko Joane Sunahara from 1958 to 1965, with three children (Tamiko, Laura, and Troy). He then married Tara Elizaqbeth Cullis (Since 1972) with two daughters: Severn and Sarika Cullis-Suzuki. His Japanese name is Suzuki Takayoshi , but he is always known by his English name to the public, even in Japanese scientific and popular literature (using Romaji).

David Takayoshi Suzuki, CC, OBC, Ph.D (born March 24, 1936), is a Canadian science broadcaster and environmental activist. Since the mid-1970s, Suzuki has been known for his TV and radio series and books about nature and the environment. He is best known as host of the popular and long-running CBC Television science magazine, *The Nature of Things,* seen in syndication in over 40 nations. He is also well known for criticizing governments for their lack of action to protect the environment.

A long time activist to reverse global climate change, Suzuki co-founded the David Suzuki Foundation in 1990, to work "to find ways for society to live in balance with the natural world that sustains us." The Foundation's priorities are: oceans and sustainable fishing, climate change and clean energy, sustainability, and David Suzuki's Nature Challenge. He also served as a director of the Canadian Civil Liberties Association from 1982-1987.

Early life

Suzuki had a twin sister named Marcia, as well as two other siblings, Geraldine (now known as Aiko) and Dawn. They wee born to Setsu Nakamura and Kaoru Carr Suzuki in Vancouver, Canada. Suzuki's maternal and paternal grandparents had immigrated to Canada at the beginning of the 20th century.

A third-generation Japanese-Candian ("Canadian Sansei"), Suzuki and his family suffered internment in British Columbia during the Second World War from when he was six (1942) until after the war ended. In June 1942, the government sold the Suzuki family's dry-cleaning business, then interned Suzuki, his mother, and two sisters in a camp at Slocan in the British Columbia Interior.[1] His father had been sent to a labour camp in Solsqua two months earlier. Suzuki's sister, Dawn, was born in the internment camp.

After the war, Suzuki's family, like other Japanese Canadian families, was forced to move east of the Rockies. The Suzukis moved to Islington, Leamington, and London, Ontario. David Suzuki, in interviews, has many times credited his father for having interested and sensitized him to nature.

Suzuki attended Mill Street Elementary School and Grade 9 at Leamington Secondary School before moving to London, where he attended London Central Secondary School, eventually winning the election to become Students' Council President in his last year there by more votes than all of the other candidates combined.

Academic Career

Suzuki received his BA from Amherst College in Massachusetts in 1958, and his Ph.D in zoology from the University of Chicago in 1961.

Early in his research career he studied genetics, using the popular model organism *Drosophila melanogaster (fruit files)*. To be able to use his initials in naming any new genes he found, he studied Drosophila temperatue-sensitive phenotypes (DTS). (As he jokingly noted at a lecture at Johns Hopkins University, the only alternative was "damn tough skin".) He was a professor in the genetics department (stated in his book Genethics: The Ethics of Engineering Life, 1988) at the University of British Columbia for almost forty years (from 1963 until his retirement in 2001), and has since been professor emeritus at a university research institute.[2]

For his work popularizing science and environmental issues, he has been presented with 22 honorary degrees.

Broadcasting career

Suzuki began in television in 1970 with the weekly show *Suzuki on Science,* a children's show. In 1974, he founded the radio programme *Quirks and Quarks* which he also hosted on CBC Radio One

from 1975 to 1979. Throughtout the 1970s, he also hosted *Science Magazine,* a weekly programme geared towards an adult audience.

Since 1979, Suzuki has hosted *The Nature of Things,* a CBC television series that has aired in nearly fifty countries worldwide.[3] In this program, Suzuki's aim is to stimulate interest in the natural world, to point out threats to human well-being and wildlife habitat, and to present alternatives for achieving a more sustainable society. Suzuki has been a prominent proponent of renewable energy sources and the soft energy path.

Suzuki was the host of the critically acclaimed PBS series *The Secret of Life.* [4] His 1985 hit series, A *Planet for the Taking,* averaged more than 1.8 million viewers per episode and earned him a United Nations Environment Programme Medal. His perspective in this series is summed up in his statement: "We have both a sense of the importance of the wilderness and space in our culture and an attitude that it is limitless and therefore we needn't worry." He concludes with a call for a major "perceptual shift" in our relationship with nature and the wild.

Suzuki's The Sacred Balance, a book first published in 1997 and later made into a five hour mini-series on Canadian public television, was broadcast in 2002.[5] [6] Suzuki is now taking part in an advertisement campaign with the tagline "You have the power", promoting energy conservation through various household alternatives, such as the use of compact fluorescent lightbulbs.

Climate change activism

In recent years, Suzuki has been a forceful spokesperson about the realities of global climate change. His comments have not always been without controversy. On February 15, 2007, Suzuki was interviewed on Toronto radio station AM 640 by morning show host John Oakley. Suzuki asserted that Canada should be branded "international outlaws" for reneging on Kyoto agreements, and dismissed as 'a log of baloney" Oakley's suggestion that some scientists feel intimidated from questioning global warming hypotheses.

Suzuki said that scientists who deny climate change are "shills" for big corporations. He contrasted his own foundation, saying that "corporations have not been interested in funding us" and that their financial backing comes "from ordinary Canadians". [7]

Suzuki is unequivocal that climate change is a very real and pressing problem and that there is now an "overwhelming majority of scientists" who are in agreement that human activity is responsible. The David Suzuki Foundation website has a clear statement of this:

> The debate is over about whether or not climate change is real. Irrefutable evidence from around the world – including extreme weather events, record temperatures, retreating glaciers, and rising sea levels – all point to the fact climate change is happening now and at rates much faster than previously thought.[8]
>
> The consensus includes the Intergovernmental Panel on Climate Change, consisting of over 2,000 scientists from 100 countries. The findings of the panel have been approved by the National Academies of Science of each of the G8 countries, along with those of China, India and Brazil.[8]

Suzuki says that despite this growing consensus, many in the public and the media seemed doubtful about the science for many years. The reason for the confusion about climate change, in Suzuki's view, was due to a well organized campaign of disinformation about the science involved. "A very small band of critics" denies that climate change exists and that humans are the cause. These climate change "skeptics" or "deniers," Suzuki

claims, tend not to be climate scientists and do not publish in peer-reviewed scientific journals but rather target the media, the general public, and policy makers. Their goal: " delaying action on climate change." According to Suzuki, the skeptics have received significant funding from coal and oil companies, including ExxonMobil. Suzuki says that they are linked to "industry-funded lobby groups to – in the words of one leaked memo- 'reposition global warming as theory (not fact)."[8]

The David Suzuki Foundation has implemented a carbon neutral program in its offices. The Foundation states that this is part of its "ongoing commitment to sustainability." The program is designed to show that "taking responsibility for one's greenhouse gas emissions is straightforward and inexpensive," It uses a guide by the World Resources Institute to calculate greenhouse gas emissions. Because of problems with tree planting projects, the Foundation purchases carbon offsets from energy efficiency and renewable energy projects. [9] Suzuki himself laments that in traveling constantly to spread his message of climate responsibility , he's "over his [carbon] limit by hundreds of tones." He has stopped vacationing overseas and taken to "clustering" his speaking engagements together to reduce his carbon footprint. He would prefer, he says, to appear solely by video conference.[10]

In 2007, Suzuki made a cross-country tour in a diesel bus, speaking to Canadians about climate change and urging compliance with the Kyoto Accord. Gold Standared carbon offsets were purchased by the David Suzuki Foundation for all bus travel and tour activities.[11] The Foundation's "David Suzuki's Nature Challenge" [12] and "David Suzuki's Nature Challenge for Kids" [13] suggest simple steps people can take to protect nature and improve their quality of life. Suzuki's spokesman said he used the diesel bus because using biodiesel would have voided the bus' warranty.[14]

David Suzuki has given talks to the NDP, Liberal, and Green Parties of Canada, but does not belong to any political party. The David Suzuki Foundation is non-partisan, in accordance with the rules governing non-profit charities in Canada.[15]

Publications

Suzuki is the author of forty-three books (fifteen for children), including *Genethics, Wisdom of the Elders, Inventing the Future,* and the best-selling *Looking At* Series of children's science books.

Awards and honours

Suzuki is the recipient of Canada's most prestigious award, the Order of Canada Officer (1976) upgraded to Companion status in (2006)[16], the Order of British Columbia (1995)[17], UNESCO's Kalinga Prize for science (1986)[18] and a long list of Canadian and international honours.

In 2004, David Suzuki was nominated as one of the top ten "Greatest Canadians" by viewers of the CBC. In the final vote he finished fifth and therefore ranked as the greatest living Canadian.[19] Suzuki said that his own vote was for Tommy Douglas who was the eventual winner .

In 2006, David Suzuki was the recipient of the Bradford Washburn Award presented at the Museum of Science in Boston, Massachusetts.[20]

Honorary degrees

David Suzuki has received 22 honorary degrees from universities in Canada, the United States and Australia:

- University of Prince Edward Island in Charlottetown (LL.D) in 1974.
- University of Windsor in Windsor, Ontario (D.Sc) in 1979.
- Acadia University in Wolfville, Nova Scotia (D.Sc) in 1979.
- Trent University in Peterborough, Ontario

(LL.D) in 1981.

- Univesity of Calgary in Calgary, Alberta (LL.D) in 1986.
- Governors State University in University Park, Illinois (DHL) in 1986.
- Lakehead University in Thunder Bay, Ontario (D.Sc) in 1986.
- McMaster University in Hamilton, Ontario (D.Sc) in 1987.
- Queen's University in Kingston, Ontario (LL.D) in 1987.
- Carleton University in Ottawa, Ontario (D.Sc) in 1987.
- Amherst College in Amherst, Massachusetts, USA (D.Sc) in 1988.
- Griffith University in Queensland, Australia (D.Sc) in 1997.
- Open University, Canada DDL in 1998.
- Whitman College in Walla Walla, Washington, U.S. (D.Sc) in 1999
- Unity College in Unity, Maine, U.S. (Doctor of Environmental Science) in 2000.
- Simon Fraser University in Burnaby, British Columbia DDL in 2001.
- York University in Toronto, Ontario (D.Sc) in 2005.
- UQAM in Montreal, Quebec (D.Sc) in 2005.
- Flinders University in Adelaide, South Australia (D.Sc) in 2006.
- Ryerson University in Toronto, Ontario (Doctor of Communication) in 2007.
- University of Montreal in Montreal, Quebec (D.Sc) in 2007.
- University of Western Ontario in London, Ontario (D.Sc) in 2007.

Family

Suzuki was married to Setsuko Joane Sunahara from 1958 to 1965, with three children (Tamiko, Laura, and Troy). He married Tara Elizabeth Cullis in 1972. They have two daughters: Sarika and Severn Cullis-Suzuki. Severn, born in 1979, has also done environmental work, including speaking at environmental conferences.

David Suzuki's Japanese name is Takayoshi Suzuki but he is always known by his English name to the public, evening Japanese scientific and popular literature (using Romaji). Suzuki lives in the Kitsilano area of Vancouver.

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Source :

"http://en.wikipedia.org/wiki/David_suzuki".

- **"Education has failed in a very serious way to convey the most important lesson science can teach : skepticism."**
- **"We must reinvent a future free of binders so that we can choose from real options.".**

...David Suzuki

Kalinga Laureate for Popularization of Science – 1987

Dr. Marcel Roche, Venezuela

[Born : 15th August, 1920, Caracas, Venezuela;
Died : 3rd May, 2003, Miami, USA]

Roche Dugand, Marcel – Biography

Dr. Roche holds an M.D. from Johns Hopkins, has taught at Harvard and at Cambridge and Sussex in England and is a distinguished medial researcher. He has done major work on anemia in rural communities of South America and extensive studies of hookworm diseases, in his research fields of endocrinology and metabolism. He has been an advisor to presidents and has served on advisory committees to UNESCO, the World Health Organizaiton and the Pan American Health Organization. Dr. Roche was president of the University Council of the United Nations University in Tokyo, a member of the Pugwash Council, a former governor of the International Atomic Energy Commission and a member of the Pontifical Academy of Sciences.

Medical, scientific, manager and explainer of science, humanistic. He was the eldest son of the town planner Luis Roche, whose ancestors had come to the country in the mid-nineteenth century, and the French lady Beatrice Dugand. Early years of his childhood in Caracas and pass the age of 9 was sent to France with his paternal grandparents, enters the College Sainte Croix de Neuilly where his father had also studied, and since that time, it gives free rein to his love of music, reading and literature, publishing a companion study a monthly magazine Le Vampire, as his interest in the natural sciences by creating a herbarium stuffed with plants that sent him to Venezuela. Ending his studies he graduated with honors. Decides to study medicine and while preparing to enter the preparatory course at the Faculty of Medicine of Paris, his father anticipating the start of the Second World War, decided in 1938 to continue his studies in the United States, studied at the College Saint Joseph's (Philadelphia) where graduates in 1942 with the title of Bachelor (Biology and Chemistry). Then, go to the School of Medicine at the Johns Hopkins University (Baltimore, Maryland), where graduates from medical in 1946. Year in which he married the painter Maria Teresa (Maruja) Rolando of which enviudó in 1970 and with whom he had four children. Just graduated from medical, spent four years in the United States, which used to

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specialize in and started the investigation; between 1947-1948 serves as Resident Assistant at the Peter Bent Brigham Hospital (Boston, Massachusetts), with the teachers to doctors George W. Thorn and Samuel Levine, it is dedicated to clinical studies. After entering as a Research Fellow (1948-1950) at Harvard University to conduct research in the laboratory of Dr. Peter H. Frosham in the areas of endocrinology, nutrition and diabetology, performing, along with several colleagues, their first publications in the New England Journal of Medicine, and then as a volunteer researcher at the Institute of Public Health in New York where he works under the supervision of Hans de Witt Stetten until May 1951, when he returns to Venezuela. He started working in the office of Francisco De Venanzi, who knew in 1948, in one of his visits to the country, establishing a friendship of a lifetime; From Venanzi, also hosts the Chair of Pathophysiology of the Universidad Central de Venezuela (UCV), while exercising medicine at the Hospital Vargas, both created the Medical Laboratory Analytical, the first step thsat led to the creation of the Institute for Medical Research Foundaiton Luis Roche (FLR) (1952-1958), From Roche and Venanzi at the helm was a private institution of research, supported by Luis Roche, which brought together doctors like Luis Carbonell, Cecilia P. of Coronil, Ruben Coronil, Karl Gaede, Miguel Layrisse, Antonio Sanabria, Maria Enriqueta Tejera Perez-Gimenez, Jorge Vera, Gabriel Chuchani chemical. Roche also engages in the activities of the Venezuelan Association for the Advancement of Science (ASOVAC) and its Secretary-General in 1958. In 1953 he presented his doctoral thesis at the UCV, revalidando its title of doctor in Venezuela. His stay in the FLR lets you develop a change in the investigations which were interested in the United States, there had dealt with the physiology and clinical of the adrenal, the study of uric acid metabolism and creatine in the gout and progressive muscular dystrophy using the isotope N15, heavy nitrogen; faced with the reality Venezuelan mid-fifties began a series of investigations of a basic but related ailments tropical Venezuelan, using as part of its methodlogy using radioisotopes. Along with de Venanzi, researches, in a systematic manner for the first time in the country, endemic goitre, a condition prevalent in the Venezuelan Andes, which causes abnormal function in the thyroid glad linked to the lack of iodine in food, using the radioiodine measuring and determining that the disease did not differ from that in other similar areas. Another finding of his research was the recommendation to iodize salt for human consumption, profilaxia that was hosted by the government of Colombia, significantly decreasing the presence of goiter in Venezuela, that practice was put into practice only from the eighties. Hand in hand with endemic goiter, studying anemias of rural populations, through the study of the origin and destination of red blood cells and iron metabolism and nutrition for individuals; develops this line of research with Miguel Layrisse, Estela and DiPrisco Maria Enriqueta Tejera Perez-Gimenez; for it “marked” red blood cells with radioactive chromium to determine the loss of blood through bowel between patients and accurately determine the magnitude of blood expoliada on average by a single worm anquilostomo; with a similar method but using chromium and iron measured the amount of iron that was reabsorvido; the methods used were designed by the group. The study of the iron absorption was continued by Layrisse and Carlos Torres-Martinz when they moved to the Venezuelan Institute of Scientific Research (IVIC). When falling dictatorship of Generla Marcos Perez Jimenez in January 1958, is called by the military civic government to take charge of the Venezuelan Institute of Neurology and Brain Research (IVNIC) located in Altos de Pipe, which was founded in 1954 by a doctor and biophysical Venezuelan Humberto Fernandez Moran. Encarado to the

reality of an institution still medium build, which provided some buildings and scientific equipment and technicians to operate them, but lacked investigators with the exception of Dr. Femandez Moran, urged his colleagues to come to the FLR IVNIC, open laboratories, and initiating the training of young scientists as Venezuelans. This, together with the fact that De Venanzi was called by teachers and students at the Central University of Venezuela, to take charge of the Rectory makes in practice, the FLR disappear. Thus, Layrisse, Chuchani, Carbonell and Gaede joined Roche in the new company which resulted in the Venezuelan institute of Scientific Research (IVIC), created by the military civic government headed by Dr. Edgar Sanabria on February 9, 1959. Roche was appointed its first Director (1959-1962), after the Executive hear the views of the Assembly of Researchers IVIC, as provided for the creation of statute. He was subsequently elected and ratified by the Government of the day in that office during 1962 to 1969. During this time, Roche along with his colleagues from the FLR, other Venezuelan and foreign-as Gunnar Svaetichen and Gernold Bergold had worked in the IVNIC-IVIC laid the foundation, a research institute, state, multidisciplinary (physics, mathematics, chemical biology and medicine) oriented basic and applied science, with responsibilities to train high-level scientific (postgraduate), and advise both the National Executive as to others . Until then research institutes of the State, except for the IVNIC, had been aimed at the application of knowledge to solve the pressing demands of the needs of the executive branch in knowledge. IVIC a milestone because his energy directed toward obtaining knowledge, capable of linking to the mainstream of scientific thought universal part of this, as well as Roche express years later, was the ability of its researchers to publish their findings in the most prestigious international scientific journals in their fields. This is accomplished in part by creating a layer of researchers, which you enter once the applicant has completed his scientific training, it is usually having achieved the title of a Ph.D. or an equivalent path; promotion is done based on a periodic assessment by the Commission of the Institute Clasificadora revising the production of knowledge published, in particular. These guidelines set out early and put into practice since the first term of Roche versus IVIC, led to the profesionalizara career scientist in the country. Similarly, early Roche sponsored the training of scientists in the Venezuelan IVIC, and through a first training in laboratories of the institution of newly graduated university professionals and / or disposed towards research , and then being sponsored by the institution to complete their studies abroad reaching a doctoral degree or Ph.D. All subjects were benefited by this investment, which allowed after ten years IVIC could count on an array of multidisciplinary researchers, who were working at various centres or departments: Experimental Medicine, Microbiology, Biochemistry and Biophysics, Chemistry, Ecology, Mathematics and Anthropology. It was early in the strength-date scientific information, buying complete sets of magazines and maintaining permanent subscriptions, which has enabled the IVIC have a valuable collection of periodicals, the basis of the existing library since 1981 by a decision of Board of IVIC step renamed Library Marcel Roche. In addition to the strictly scientific affairs, Roche developing institutional policies for all their employee, sponsoring the creation of the Fund Savings Institute, stimulating agremiación of wokers, the discussion of collective contracts, the creation of a medical service, a dining industry, a kindergarten and a primary school. Since the editorials he wrote for the Bulletin Internal IVIC – in part in compiling his first book Log-63 – developed a workd to educate, explain and clarify the different aspects and problems that were appearing in the diverse community who constituted IVIC; led the first coral that had the Institute was producing a

programme of popular science: Science (1968-1969) among us to be transmitted through the state televsion, Channel 5. He left his imprint also to equip the IVIC of the first works of art and the interior of their buildings as outdoor collection like that of the library has been increased by one each of the successive directors of the Institute, reaching count that one of the most important art collections in the country outdoors. During their management as director IVIC, found time to engage in research, but not in the intensity he would have liked; continuing with its work on Layrisse anaemia in rural areas, and with Carlos Torres-Martinez has dedicated his attention to the study of anquilostomo itself, which designed a device that allowed her observation and filming. As part of this documentary produced in vitro Studies of Ancylostoma caninum, which won the gold medal (1961) in the first movie review medical literature health Italian Cultural Center Film (Pavia). Anquilostomo This line of the continued until early seventies when again he had to take care of another task management. While half of his third year as Director of IVIC, was called by the executive to handle the launch of the National Council for Scientific and Technological Research (CONICIT), as its first director-founder between 1969-1972. This designation, recognizing the efforts of Roche at the helm of the Preparatory Committee of the CONICIT (1962-1965), through which scientists IVIC, UCA and the ASOVAC been made in favour of the creation of a state institution policy and planning for science. As the initiator of another institution of science in the country, a fact the foundation of the philosophy and organization of the same, to support science in the country, to benefit researchers and through grants granted on presentation of research projects reviewed by evaluators commissions composed of scientists from various institutions; stimulated the formation of human resources for the sector, through a programme of postgraduate scholarships abroad, which had persisted to this day despite attempts to centralize this type of action in the Gran Mariscal de Ayacucho Foundation. He promoted the education of science in pre-university education through the creation of the National Center for Improving Science Education (CENAMEC). It speeded statistical knowledge of science in the country, had to do so with the cooperation of the sociologist Olga Gasparini (1932-1971) at the head of a group of sociologists who, even after he died that produced the Diagnosis of the activity research and experimental development that takes place in the country (1973). Finally defining and designing a science and technology policy, either through documents or action plans. Thanks to the action of Roche in CONICIT, was formed Research Center Astronomical Francisco Jose Duarte (CIDA), which finally was able to stay around the team astronomy (among which was a camera Schmidt), which in mid-fifties had compared the government of Perez Jimenez based on a project to modernize the old section of astronomy Cajigal Observatory located in Caracas; CIDA was located in Hato del Llano, near Merida and the University of the Andes (ULA); other institutes like Research Center for Export (CIEPE) located in San Felipe (Yaracuy) were “nationalized” when CONICIT led to the entry of Venezuelan investigators, and with the creation of the Committee on Hydrocarbons, began planning an institute of oil, INVEPET that after the nationalization would become the INTEVEP. Part of their experiences and thoughts at the forefront of the CONICIT vertería in his book Discovering Prometeo. On his departure from CONICIT (1972), Roche actually began his second career in science, but also that year he married White Flower Fombona. His stay in CONICIT had finally removed from the laboratory, but their intellectual reflection oriented toward history and sociology of science. Decides to go to the University of Sussex, Brighton, in southern England where admitted as graduate student in the Department of History and Sociology of Science (1972-1973), under the influence of historian Roy MacLeod and physical mathematical

and historian Brian Easlea. After serving as a Research Fellow (1973-1974) in the Unit for Science Policy Research (SPRU) from the same university, where he met Christopher Freeman. At the end of his return to IVIC (1973), what do specifically in the Department of Anthropology, creating Laboratory Laboratroy of History and Sociology of Science, where he wrote his classic text, Rafael Rangel: Science and politics in the early twentieth century , which was edited by Monte Avila, editing depleted in two months, a second edition came out in 1978. In 1976, organized by the Department of the Study of Science in the same IVIC, of which he was a founder-Chief until his retirement in 1990. In the social sciences, Roche was as productive as when he was a biomedical researcher. While his goal at one time was to present his thesis to get his doctorate in Sussex, Roy MacLeod what persuaded that his career he had the necessary tools to move in the area of social studies of science, becoming an exemplary figure for social scientists who recently joined a field in the seventies was new in Venezuela. In a way he fixed number of parameters of this specialty, emphasizing the key role of the history of science as part of the reconstruction of national identity, as well as the need for a history and sociology of science to locate the scientist in his Venezuelan social, economic and historical, without losing what made the prospect of contemporaneity at different times in history. Interested in enrich the training of graduate students in the IVIC convince educational authorities of the Institute of introducing curriculum in a course of study in which they give notions of history, sociology, philosophy and political science and technology (1983). At that time also served as the editor-founder of the magazine Interciencia (1976-1998); develops more widely his facet as explainer of science, writing articles in EI Diario de Caracas, some of them are complied in his book My Commitment with Science (1987); because of this activity receives the Award Jose Moradell 1982, popular science given by the Circle of Science Journalism Venezuela, and in 1987 the prize awarded by the UNESCO Kalinga to the Popularization of Science. Being named Ambassador Standing before UNESCO moved to Paris to live there between 1985-1989; distance addressed Master's thesis and doctoral students, started writing his autobiography and Olvidos Memories (1996) and organized the writing of the collective work, the profile Science in Venezuela (1996), which received the Award for Best Divulgativo Book of the Year 1995, awarded by Fundalibro. When given retirement in 1990 remains active, both in their research in the IVIC in Interciencia, but for health reasons chooses to pull out in 1996. He had an active life in various scientific societies, Member (desde 1968) of the Pontifical Academy of Science, Founding Member and Secretary Academy of Sciences for the Third World (1983), President (1989-1992) of the Association Interciencia . Participated in the body publisher of magazines like Physiological Reviews, in the Editorial Board of Social Studies of Science (1973-1976), and Venezuelan Scientific Act (1978-1985), Scientrometrics (1981-1996), Arbor (1984-1996), was a member (desde 1981) Circle of Science Journalism Venezuela. Concerned about the problem of the use of science, actively participated in the Pugwash Movement which brings together scientists interested in the non-proliferation of nuclear weapons and / or mass destruction, as part of its Council (1976-1986). He represented Venezuela before various international organizations of science and culture, as Governor (1958-1960) to International Atomic Energy Agency (IAEA), member (1960-1964) of the Council of Higher Education in the American Republics (CHEAR) and its President (1964-1966); Scientific Advisor (1967) of President Raul Leoni at the meeting of presidents in Punta del Este. Member of the University Council (1974-1980) of the United Nations University (UNU),

Tokyo and Chairman of the Council (1978). Member of the Board of Trusts (1975-1977), International Foundation for Science (IFS) Stockholm, as well as the Advisory Committee for the Application of Science and Technology for Development (ACAST) (1975-1979) UN. Consultant Inter-alia: UNESCO, World Health Organization, Pan American Health Organizaiton, the Organization of American States Inter-American Development Bank, Ford Foundation. Recognized by colleagues within the country and outside the country, designársele Corresponding Member of the National Academy of Medicine of the National Academy of Sciences, Physical and Natural (Venezuela), the Argentine Society of Biology and the Brazilian Academy of Sciences. Foreign Correspondent (1984) of Académie Nationale de Médecine de France, of the Academy of Science of India (1983), Member of the Honorary Committee of the European Academy of Sciences, Arts and Letters, (1985). Elected Felow (1979) of the American Association for the Advancement of Science, for his contributions to medical science, the growth of scientific research in Venezuela, and the development of scientific cooperation inter as director of the magazine Interciencia. He was decorated with several national orders (Liberator, Francisco de Miranda, Andres Bello, Health Enrique Tejera), and foreign (Order de la Couronee, 1960 from Belgium, Great Cross of Merit for Special Services, 1978, the Federal Republic of Germany), was awarded the Doctor Honoris Causa from Case Institute of Technology (Cleveland, USA) (1960), University of the Andes (1972) Saint Joseph's University (1992); received honors as a Fellow Queens' College (1970), Cambridge, Montgomery Fellow (Summer 1982), Dartmouth College, Humanist Laureate, Academy of Humanism, Buffalo, New York, 1989, Honorary Member Society of Natural Sciences La Salle, 1992. Interested in the arts, especially in music, played cello, was integral to artistic and cultural groups serve as a Member of the Jury Income (1954-1957) Annual Hall Museum of Fine Arts (1978-1984) Founder President of the Association for Chamber Music Caracas, Member (desde 1979) Consultative Council, Society Symphony Orchestra of Venezuela, President (1977-1978) of the Humboldt Cultural Association, Caracas among others. Dominaba Spanish, English and French fluently with the mother tongue. Throughout his life he wrote poetry in French, a collection of his poems published in English under the title of Refuge du Divin (1984). Due to the wish his ashes in the gardens were watered IVIC

Yajaira Freites

Study of the Department of Science, IVIC

Kalinga Laureate for Popularization of Science – 1988

Dr. Björn Olof Lennartson Kurtén, Finland (Björn Kurtén)

[Born: 1924, Vassa, Finland
Died : 28th December, 1988]

" None of the dead can rise up and answer our questions. But from all that they have left behind, their imperishable or slowly dissolving gear, we may perhaps hear voices, 'which are now only able to whisper, when everything else has become silent …"

...Björn Kurtén

Björn Olof Lennartson Kurtén (1924-1988) Biographical Profile

Kurten, Bjorn

Sex	:	Male
National Origin	:	Finland
Ethnic Origin	:	Swedish
Era	:	Late 20th Centry
Born	:	1924
Died	:	1988
Awards	:	Finnish State Literary Prizers (1969, 1981, 1982), Swedish Writers' Award New York Academy of Sciences Children's Science Honor Book Award

Björn Olof Lennartson Kurtén (1924 – 1988) was a distinguished vertebrate paleontologist. He belonged to the Finland- Swedish minority in Finland. He was also the author of an acclaimed series of books about modern man's encounter with Neanderthals, such as *Dance of the Tiger* (1978, 1980). When asked what genre these works belonged in , Kurtén coined the term *paleofiction* to describe his oeuvre. This genre was popularized by Jean M. Auel in her Earth's Children series of books.

In the 1980s, Kurtén also hosted a 6-part TV series about the ice age, co-produced by several Scandinavian TV channels.

Bjorn Kurten is known around the world for his research and his writing, both fiction and nonfiction. A Professor of Paleontology at the University— Helsinki since 1955, he is the author of six books which have been translated into more than half a dozen languages. His books available in English include *The Age of Mammals, The Cave Bear Story,* and the forthcoming *On Evolution and Fossil Mammals,* all published by Columbia University Press.

Finnish writer, professor of paleontology at the University Helsinki, who gained international fame as a writer with his popular science fiction books of ancient men, DEN SVARTA TIGERN (1978, Dance of the Tiger) and MAMMUTENS RÅDARE (1982, Singletusk). Along with George Gaylord Simpson in America, Björn Kurtén was the founding father of an important scientific movement that united Darwinian theory with empirical studies of fossil vertebrates. He was also a leading student of fossil bears – and by chance his first name Björn means "bear" in his native Swedish.

"Kurtén has managed to insinuate into his story – in a way so subtle and natural that we can scarcely recognize he is teaching as well as novelizing – every fact and theory that I know (and several, undoubtedly, that I don't) about Neandertals, Cro-Magnons, human evolution during the Ice Age, glacial geology, and ecology and behavior of the great Ice Age mammals, including mammoths and saber – toothed tigers."

(Stephen Jay Gould in his introduction to Dance of the Tiger)

Björn Kurtén was born in Vaasa as the son of Lennart Kurtén, a bank director, and Hjördis (Ståhlberg) Kurtén. While in school he started to write adventure stories. His first book, DET NYA JAKTPLANET, appeared in 1941. It was followed by SPÅRET FRÅN ULTIMA ESPERANZA (1945). Aln 1943 Kurtén entered the University of Helsinki, where he studied geology and zoology. He was editor of *Studentbladet* and during the next decades he wrote a number of popularized essays about paleontology for *Hufvudstadsbladet* and *Vasabladet.*

In 1950 Kurtén married Ruth Margareta Nordman; they had four children. Before finishing his studies in Helsinki, Kurtén studied paleontology in Sweden at the University of Uppsala under Birger Bohlin and received his Ph.D in 1954. Kurtén first major scientific publication, THE CHINESE HIPPARION FAUNA, appeared in 1952. Especially Georg Gaylord Simpson's (1902-1984) *Tempo and Mode in Evolution* (1944) influenced his early works.

From 1955 to 1972 Kurtén was lecturer at the University of Helsinki. He was also a researcher at the University of Florida, a visiting professor at the University of Harvard (1971-71) and a professor at the University of Helsinki from 1972 to 1988. In Spain and Tunisia Kurtén participated in scientific excavations. He died in Helsinki on December 28, 1988. Kurtén received several awards for his popular scientific works, including Unesco's Kalinga Award . Earlier it had been given among others to George Gamow, Fred Hoyle, Julian Huxley, Konrad Lorenz, Margaret Mead and Bertrand Russell.

Among Kurtén major scientific publications are his dissertation, ON THE VARIATION AND POPULATION DYNAMICS OF FOSSIL AND RECENT MAMMAL POPULATIONS (1953), PLEISTOCENE MAMMALS OF EUROPE (1968), published in the same year in Sweden, Great Britain, Germany, Italy, France and Holland, and PLEISTOCENE MAMMALS OF NORTH AMERICA (1980). INTE FRÅN APORNA (1971) was also translated into several languages. In 1988 appeared ON EVOLUTION AND FOSSIL MAMMALS, a collection of earlier studies.

" I suspect that our view of men who live in close contact with nature is colored by the romantic image of the taciturn Red Indian, the epitome of the Noble Savage. In contrast, my experience of the men of forests and lakes is that they are loquacious to a degree, with a great fund of small talk; they carry their hearts on their sleeves: Aloofness is a simply a mask put on before a stranger. A large vocabulary is characteristic of the so-called primitive languages of today, and probably has been so for millenniums. To find a really primitive language I suspect you would have to journey back in time to the beginning of the Ice Age." *(from Dance of The Tiger)*

In the 1970s Kurtén returned to fiction with *Dance* of the Tiger, set in the era of 35 000 years ago in Scandinavia, during a thaw in the great Ice Age. It depicted story of Tiger, the chief of a Cro-Magnon tribe, and his wife, Morsinko, a Neanderthal woman. Neanderthals are white-skinned, Cro-Magnons dark; Cro-Magnon children and adults have smooth brows and small faces; the characteristic features of childhood act as "innate releasing mechanisms" for feelings of affection – a theory familiar from Konrad Lorenz's writings. "To the Whites, the Blacks were godlike, tall and eloquent, with a speech as varied and flexible as that of the birds. And there was something else. No White could look at the clear brow of a Black without feeling a mysterious tenderness, such as a child might evoke in the heart of his parents."

Kurtén offered the explanation that the Neanderthals disappeared because they fell fatally in love with their black and beautiful Cro-Magnon neighbours, and brought them home to engage in sterile matches. The Cro-Magnon people, who were more aggressive and practiced slavery and violence, conquered the peace loving Neanderthal society, based on matriarchal system. Also the nobel writer William Golding has examined in *The Inheritors* the vanishing of the Neandertal – Golding saw them children of nature who are destroyed by the brutal invaders.

Singletusk, his next novel, continued the story of the family. Kurtén's picture of the prehistoric society is realistic without exaggerating the violent aspects of life. He focused on the development, everyday life, and dreams and fears of the ancient people. Both works were mostly based on scientific theories – Kurtén supposition that Neanderthals and ancestors of modern Homo Sapiens occupied same areas in the same time in Europe have been confimed by fossil evidence.

For further reading: 'Björn Kurtén – a memorial volume', ed. by Ann Forstén, Mikael Fortelius, Lars Werdelin, in Annales Zoologici Fenici (1991,); 'Muinaisaikojen elävöittäjä Björn Kurtén' by Anto Leikola in Kansallisgalleria: Suuret suomalaiset, ed. by Allan Tiitta et al. (1997); 'Kurtén, Björn' by Anto Leikola, in Suomen kansallisbiografia 5, ed. by Matti Klinge et al. (2005) –**Other prehistoric fantasies:** Johannes V. Jensen's *Den Lange Rejse* (1908-22); J.H. Rosny's *La guerre de feu* (1909); Edgar Rice Burrough's *The Eternal Lover* (1925); J. Leslie Mitchell's *There Go Back* (1932); William Golding's *The Inheritors* (1955); note also such romantic works by Jean Untinen – Auel as *The Clan of the Cave Bear* (1980), *The Valley of Horses* (1982), *The Mammoth Hunters* (1985), *The Plains of Passage* (1990) – **See also:** L.S.B. Leakey

Selected works:

- DET NYA JAKTPLANET, 1941 – Uusi hävitäjä
- DE TRE KORSEN, 1945 – Ultima Esperanzan jälki
- DE TRE KORSEN, 1948 – Kolme ristiä
- THE CHINESE HIPPARION FAUNA, 1952
- ON THE VARIATION AND POPULATION DYNAMICS OF FOSSIL AND RECENT MAMMAL POPULATION, 1953
- SEX DIMORPHISM AND SIZE TRENDS IN THE CAVE BEAR, URSUS SPELAEUS ROSENMÜLLER AND HEINBROTH, 1955
- LIFE AND DEATH OF THE PLEISTOCENE CAVE BEAR, 1958
- CHRONOLOGY AND FAUNAL EVOLUTION OF THE EARLIER EUROPEAN GLACIATIONS, 1960
- URMÄNNISKOR OCH SABELTIGRAR, 1961 – Alkuihmisiä ja sapelitiikereitä
- MÄNNISKANS UTVECKLING, 1963- Ihmisen Kehitys
- ISTIDENS DJURV ÄRLD, 1964 - Jääkauden eläinmaailma
- THE CARNIVORA OF THE PALESTINE CAVES, 1965
- PLEISTOCENE BEARS OF NORTH AMERICA, 1966-67
- PLEISTOCENE MAMMALS OF EUROPE, 1968
- DINOSAURIERNAS VÄRLD, 1968 – The Age of Dinosaurus – Kirmuliskojen maailama

- ISTIDEN, 1969 – The Ice Age – Jääkausi
- DÄGGDJURENS TIDSÅLDER , 1971 – The Age of Mammals – Nisäkkäiden aikakausi
- INTE FRÅN APORNA, 1971 – Ei apinoista
- BJÖREN FRÅN DRAKHÅLAN, 1975 – Lohikäärmeluolankarhu
- DEN SVARTA TIGERN, 1978 - Dance of the Tiger – Musta tiikeri
- HUR MAN FRYSER EN MAMMUT, 1980- Kuinka mammutti pakastetaan
- 63 FÖRSTENADE HJÄRTAN, 1980- 63 kivettynyttä sydäntä
- PLEISTOCENE MAMMALS OF NORTH AMERICA, 1980 (with Elaine Anderson)
- MAMMUTENS RÅDARE, 1982- Singletusk – Mammutin suojelija
- VÅRA ÅLDSTA FÖRFÄDER, 1986 – Vanhimmat esi – isämme
- DE SKULDLÖSA MÖRDARNA, 1987 – Viattomat tappajat
- BEFORE THE INDIANS, 1988- Ennen intiaaneja
- ON EVOLUTION AND FOSSIL, MAMMALS 1988

Kalinga Laureate for Popularization of Science – 1989

Dr. Saad Ahmed Shabaan, A.R of Egypt

Responsibility of any Science Writer is not Just to explain to the general public modern inventions & discoveries, and their useful applications to the good of humanity – It is probably more important to expose and denounce the uglier side of the almost criminal misuses of technology that could lead our world to perdition.

…Dr Saad Ahmed Shabaan

A Brief Profile of Dr. Saad Ahmed Shabaan

For the first time in the history of this prize, a representative of the Arab region has been selected as the winner. The laureate is unique also in being the first recipient of the Kalinga Prize to have had a long and brilliant military career (beginning as a young engineer- officer and rising to the high rank of Major General in the Air Force). Given Emperor Ashoka's progression from military to peaceful activities, this may be thought to be a fitting background for a winner of the Kalinga Prize.

Dr Shabaan has been engaged for over 35 years in propagating scientific and technological culture on the broadest possible basis in Egypt and the Arab world ranging out from his fields of special competence – electrical engineering aviation and space – into the large number of adjacent fields of science.

Throughout these years of uninterrupted work, he has spared no effort to break down the barriers between the scientific community and the general public with the aim of helping to establish the broad scientific basis necessary for the overall development of his society. Conscious of the importance of direct human contact and interaction, he has placed great emphasis on public lectures and symposia in educational, social and professional institutions. He has also made extensive use of the media- books, newspaper articles, radio and television programmes – to interpret science and technology to the public at large. His output in this regard is impressive: he is the author of 26 scientific books and some 400 scientific articles and he has produced over 200 radio and television programmes.

Dr Shabaan has earned numerous national as well as international honours, including the Medal of Honour of the World Aerospace Education Organization. He served for many years as editor-in-chief of a number of scientific and military magazines and also as a member of the space Commission at the International Aeronautic Federation. Currently, Dr Shabaan is Director of the Office of the President of Egypt.

PRESENTATION OF THE KALINGA PRIZE FOR 1989

Unesco House
Paris, November 8, 1989

Acceptance Speech

by

Dr Saad Ahmed Shabaan
Winner of the 1989 Kalinga Prize

Mr Director-General of Unesco,

Mr President of the General Conference,

Mr Chairman of the Executive Board,

Ladies and Gentlemen,

As I stand here to received this prize, I must express my respects to the Director- General of Unesco, Dr Federico Mayor, the Prize jury members, the Egyptian National Commission for Unesco and the distinguished audience. It is certainly an honour which I will always hold in high esteem and pride. I feel, however, that this is too much for me, not out of modesty, but in recognition of the fact that fantasies of achieving maximum wisdom and learning only mean credulity and ignorance. Newton touched on the same meaning by saying that "all the knowledge that mankind could gather is only a grain of sand on an endless beach." And more than twelve centuries before Newton, the Moslem Holy Book (Koran) stated that the waters of oceans are not enough to record God's knowledge.

Ladies and Gentlemen,

When I received a telex from Unesco on 22 October telling me that I had been awarded the Kalinga Prize, the happy news coincided with a great scientific event that takes place twice every year in the Abu-Simble Temple in Upper Egypt. That temple is designed in such a manner that direct rays of sun fall twice annually on the face of King Ramses, the second statue: once on 22 October to mark his coronation, and the other time on 22 February to mark his birthday. The event, watched yearly by thousands of foreign tourists, has been recurring for more than 3,300 years without fail. It certainly testifies to ancient Egyptians' skill in astronomy and architecture as well as in chemistry and medicine. Here, I must remember with all gratitude the tremendous role of Unesco in saving the invaluable temple from being submerged in Nile water before the builing of the High Dam, south of Aswan.

But the Pharaonic civilization mingled in later phases with other civilizations, the most outstanding of which is the Islamic one. It is quite significant in this respect to note that the first quotation in the Moslem Holy Book urged the prophet to read and consider. There are even countless recommendations in the Holy Koran, in fact explicit orders, to man to think and reflect on every possible phenomenon in our universe, human or natural.

As a young man, more than 35 years ago, I found in these divine teachings motive enough to read and learn as much as I could, and later to present my people with the fruits of my readings through newspaper and magazine articles, television and radio programmes, books, lectures and every other possible means. Along this path, my experience taught me to resort to simplification and avoid detailed technical complexities which interest only experts and professionals. I emphasize again the absolute importance of simple rendering, because the Third World still suffers from a double-faced illiteracy: the inability to read and write on the one hand, and a scientific illiteracy on the other hand. Fortunately, educational efforts in my country have reduced illiteracy in recent years from 80% to 52%. At this point, I must admit, that my happiness with the Kalinga Prize is only exceeded by my happiness at knowing that Unesco has declared the year 1990 an international year for fighting illiteracy. We earnestly hope this noble move will persuade world leaders to devote more of their time and effort to eliminate this disgrace.

One more point I want to press as forcefully as I can: I strongly believe that the responsibility of any science writer is not just to explain to the general public modern inventions and discoveries, and their useful applications to the good of humanity. It is probably more important to expose and denounce the uglier side of the almost criminal misuses of technology that could lead our world to perdition. Examples of such dangers are: ecological pollution, diseases resulting from inordinate use of chemicals, and nuclear power without proper safety measures, the rise of temperature on earth due to excessive use of protected agriculture, and the excessive use of highly volatile gases which cause depletion of the ozone layer.

Mr Director – General,

Ladies and Gentlemen,

The glow and warmth of the occasion shouldn't let me forget the fact that the coming of the prize from India bears, for me, added significance, since our two countries share so may tenets and values. I admit again I am particularly proud of this great honour because it originated in a pioneer Third World country that has proved that science and technology should never be the monopoly of a particular race or civilization. We all regard with admiration the giant steps that India has taken along the path of scientific progress in recent history.

And now that my efforts are happily crowned with the prestigious prize, I feel an added responsibility to continue the mission I started many years ago. I also feel deep gratitude to all those in my country and the Arab world who helped my work reach readers and audiences everywhere in the Arab nations.

Thank you very much again.

Kalinga Laureate for Popularization of Science – 1990

Prof. Misbah-Ud-Din Shami, Pakistan

[Born : 1st October, 1930, Jullundhur City, India...]

Autobiography of Prof. Dr. Misbha-ud-Din Shami

Dear Dr Mishra,

Many thanks for your email date July 30, 2008. On a second thought, I realized that the information given in my brief CV might be rather scanty for writing a biography. I am sending you herewith some additional information on the basis of my memory as faithfully as possible . Here it is.

My Ancestors

My ancestors belonged to Hoshiarpur District (East Punjab, India). My father became orphan at the very young age of one year when his father died, and after another year his mother left for an eternal abode. He was brought up by his aunt who lived in Lahore, where he had his early schooling up to Matriculation at the famous Islamia High School, Sheranwala Gate, Lahore. After Matriculation, he was looked after by eldest sister who lived in Ferozepur (East Punjab, India). Soon after he applied for a job as Personal Assistant to the Deputy Commissioner, Ferozepur. It's not exaggeration to say that my father was a very handsome person with a fair complexion and greenish blue eyes. At the time of interview, he was standing in line along with other candidates and was wearing a Turkish cap. The Deputy Commissioner talked to each candidate and when he reached my father, he commented, "Who is this young Turkish General" and asked him if my father would like to serve him as his PA. My father responded positive and was thus selected for the job. After sometime, my father was transferred and posted as PA to Deputy Commissioner, Jullundur City. He lived over there till the Partition of India. Our family migrated to Lahore when I was about seventeen.

Early Education

I had passed my Matriculation examination in 1946 from University of the Punjab, Lahore, as a student of Government High School, Jullundur City. I fondly remember my school teachers including Sardar Bahgwant Singh, Sardar Bachint Singh, Sardar Phumman Singh, Sardar Ganda Singh, Master Anwar Ali, Master Shah Muhammad, Master Dalpat Rai, Sheikh Ghulam Dastgir, Lala Amar Chand and Uzami Sahib. The school was headed by a lean, thin Headmaster Heera Lal, who was a strict disciplinarian. He would not tolerate any student coming out of the class going to his home without a head dress, particularly during summer, may it be a cap, a turban, a towel or a handkerchief.

I have no hesitation in saying that I belonged to a lower middle class family during the British regime.

My father had a fair command over three languages namely, Urdu, Persian and English and was also conversant with Arabic. He was an Urdu poet and wrote poetry with his pen name as "Shami Jullunduri". He was a contemporary of Hafeez Jullunduri who is the architect of National Anthem of Pakistan. When I was student of Class – X, my father made me read an English newspaper so as to improve my language . As my interest grew in the English language, I became favourably inclined to go in for a Masters degree in the subject. No sooner my father came to know my intentions, then he asked me to change my mind and study science. He told me with conviction that Pakistan was going to be "created" and would require scientists for its socio-economic growth.

Migration to Pakistan

On migration from Jullundur to Lahore, I joined Government College, Lahore and passed my I. Sc. and B.Sc. examinations in 1948 and 1950, respectively from University of the Punjab. The teachers who inspired me to go in for science, especially Chemistry, included Professor Dr. M. A. Azeem and Professor Dr. Sardar Mohammad Chaudhry; who later became Chairman, Department of Chemistry of the College soon after creation of Pakistan.

As I had no means to continue my studies, I joined Irrigation Research Institute as Research Assistant, Lahore. After about two months my maternal uncle asked me to quite the job and pursue higher studies in a science subject. He also promised to help me financially. The entire family was overjoyed on the advice of my uncle. So I went to Government College, Lahore to collect a blank form of admission for a Masters Degree Program. I filled in the entire form but left the option of the discipline open. When I was entering the College, I came across two of my very intimate friends who were my class fellows at the B.Sc. level. They were surprised to see me as I had told them about my inability to continue my studies. They had already completed their admission forms and submitted to the College authorities. One of them had opted for M.Sc. Chemistry, whereas, the other one had applied for M.Sc. Chemical Technology. Both argued very vehemently to persuade me to go for the discipline of their choice. I could not afford to annoy any one of them. We all went to the junior lecture hall of Chemistry Department of the College where I offered them a solution. Good luck smiled on me and I chose the subject of Chemical Technology by toss of a coin.

First Assignment

It was 16th of June 1952, when I appeared in the last theory paper of my M.Sc. (Tech) examination. I went home and feeling totally relaxed went to bed although it was 114°F – a very hot summer day. I had just slept when my father woke me up telling me that an attendant from the Institute of Chemical Engineering and Technology, Punjab University had come to take me to the Institute as per orders of the Director. I was cursing myself and had no choice but to accompany the attendant. The attendant informed the Director that I had come and would like to see him for the purpose known to the Director only. So, I was called in an was asked to take chair which I took reluctantly shear out of respect as I was still a student. He offered me five different jobs outside the Punjab University, to which I politely refused giving one reason or the other. Finally, the Director's face turned red as he would never rebuke anyone. He had a lot of patience and tolerance. He had been very kind to me as a student. He remained quiet for sometime and then said, "Do you know why I have called at this odd moment?" "Sir, I do not know", was my reply. He told me that he had decided to appoint me Lecturer in Applied Analytical Chemistry in the Institute initially on ad-hoc basis for a period of three months as the university was closed. I vividly remember it was Wednesday when this episode occurred. He asked me to have rest for four days and report on Monday for the job. I could not appreciate this offer as my result for the M.Sc. examination had not been declared . On my hesitation he asked me, "What is bothering you?" I replied that the result of my examination had not been declared; so how I could be appointed under such a situation. He smilingly replied that it was his headache. As per verbal orders of the Director, I joined the Institute. I had accepted the offer because I could not afforded to leave my family and live outside Lahore. I was appointed Lecturer on a regular basis by the Punjab University authorities in October 1952.

Regular Service

I served the Punjab University for 24 years in various capacities which included Lecturer, Associate Professor, Professor, Director of the Institute, Dean of the Faculty of Sciences, Engineering and Pharmacy (covering fourteen departments / institutes) and Pro-Vice Chancellor till 1976. During my stay at the university, in 1960, I got an American scholarship to work for my Ph.D. at Washington State University, Pullman, WASHINGTON. My four years stay over there added tremendously to my knowledge of Chemistry. On my return, I started teaching Chemical Thermodynamics and Structural Inorganic Chemistry to the graduate students of the Institute . In 1969, I was selected as an Academic Visitor jointly by the Royal Society of UK and Nuffield Foundation to undertake post-doctoral research in the Department of Chemical Crystallography, Imperial College of Science and Technology, London under the able guidance of Professor D. Rogers.

In July 1976, I was transferred from Punjab University to the then University Grants Commission, Islamabad as its Whole-time Member with the status of Vice Chancellor. In June 1980, I was appointed as Chairman, Pakistan Science Foundation, Islamabad by the Government of Pakistan – a position I held till my retirement in October 1990. As mentioned earlier, I was not willing to leave Lahore. It is a shear irony of fate that I had to go to a town named Islamabad which had never existed when I joined my service . Besides, I could never think that I would serve organizations such as University Grants Commission and Pakistan Science Foundation which only came into existence in 1974 and 1973, respectively.

Association with NGOs

During my service, I had the honour to be associated with some important NGOs pertaining to the field of science and technology which are mentioned below:-

- President and Secretary General, Pakistan Academy of Sciences, Islamabad
- President, Pakistan Association for the Advancement of Science, Lahore
- President, Scientific Society of Pakistan, Karachi
- President, Pakistan Association of Scientists and Scientific Professions, Karachi
- Vice President, Pakistan Institute of Chemical Engineers
- Vice President, Islamic World Academy of Sciences, Amman, Jordan

I have the honour to be the sole Pakistani who was member of International Advisory Panel, East West Center, Hawaii, USA.

Family Members

On my return from USA, I got married in 1965 with one of my distant relatives. Her field of interest was Zoology, and she was the first girl to secure first class first position in the history of Punjab University and earned a Gold Medal. She joined Provincial Service as a Lecturer in a Government College for Women, and served at several girls' colleges in different positions before retiring as Principal in 1999. She holds Ph.D degree in Zoology.

I am blessed with two sons and two daughters who are married, and by the Grace of God well settled. The eldest daughter holds Masters Degree in Business Administration and her husband is working as Director General in Ministry of Foreign Affairs. He is a former student of famous King Edward College, Lahore and is a Medical Doctor. However, he was selected in the Foreign Service of Pakistan through Federal Public Service Commission. They have five children, three daughters and two sons.

Next to the eldest daughter is my son who is basically an Aeronautical Engineer in the Pakistan Air Force. He had earned his Ph.D. in Manufacturing Engineering from the University of Birmingham, Edgbaston, UK. He is currently working as an Associate Professor in the College of Aeronautical Engineering, National University of Sciences and Technology, Risalpur. His wife is a Lady Doctor and holds M.B.B.S. Degree. They are blessed with three sons.

The second daughter holds Masters Degree in Computer Science and is happily married. Her husband is also an Air Force officer stationed at Islamabad. He holds Bachelors Degree in Aerospace Engineering from N.E.D. University of Engineering and Technology, Karachi. God has blessed them with two sons and two daughters.

The youngest child is my second son, who is an Orthopaedic Surgeon/Consultant at the prestigious Pakistan Institute of Medical Sciences, Islamabad. He has got an M.B.B.S. Degree and is also a Fellow of College of Physicians and Surgeons, Pakistan (F.C.P.S.), the highest degree in Medical Sciences in the country. His wife is also a Lady Doctor and is specializing in Ophthalmology. The young couple has got a son a lovely daughter who is the youngest of my fourteen grand children.

I hope the above information may be of interest to you. You are at liberty to change, amend or delete any portion you may wish. I'II be sending you a copy of my speech (provided I am able to find it) and photographs in due course of time.

Regards,

Yours sincerely.

Prof Dr. Misbah-ud-Din Shami, S. I.

❑

RESUME OF DR. M.D. SHAMI'S CAREER AS POPULARIZER OF SCIENCE

Dr. M.D. Shami has had long term association with science and education. On becoming Chairman of Pakistan Science Foundaiton in 1980, Dr. Shami made Popularization of Science a very special mission for himself and the Foundation. His efforts in this direction have continued unabated over the last ten years and have given rise to programmes of far-reaching significance, directed at increasing science awareness and acquainting people with the role of science in bettering living conditions. Often in villages and far flung areas, the High School is made to serve as focal point for these programmes.

The Foundation's science popularization programmes established over the last ten years through the excellent guidance, personal supervision and active participation of Dr. M.D. Shami, are outlined below:

1. Science Caravan for Rural Areas

The Science Caravan programme was initiated in 1988 following prolonged planning and effort. It involves mobile science exhibitions that are taken to far flung and rural areas that have remained largely deprived of exposure to science and technology.

The Science Caravan employs a variety of means (attractive posters, mechanical models, dioramas and displays, video recordings, 16 mm movies, etc.) to project scientific and technological concepts. For example, visitors learn about scientific concepts concerning health and disease, hygiene and nutrition, harnessing of solar energy, man's adventure into space, modern means of communication and a host of other phenomena and accomplishments.

Computers and a mobile planetarium are part of the Caravan.

Three units of Science Caravan are already touring rural areas of Sind, N.W.F.P. and Islamabad/Rawalpindi. Units for other areas of Pakistan are under preparation.

2. Science Clubs Programme

Under this programme, establishment of Science Clubs in High Schools are encouraged through provision of financial assistance and guidance for carrying out interesting science projects. In addition, science – related literature is also provided to the participating schools.

Under Phase-I of the Science Clubs Programme initiated in 1988, five hundred schools were included. These schools were provided the following, free of cost:

i) Publication:

"Science Projects for High School Science Clubs" (10 copies per school) which was prepared under guidance and supervision of Dr. M.D. Shami. It contains instructions in both English and Urdu for carrying out interesting

science – related projects, such as preparation of paper from waste paper, preparation of soap, etc. The projects involve use of locally available, inexpensive starting material;

ii) Financial Assistance amounting to Rs. 500/- per school;

iii) Fifty copies each of leaflets on popular science themes, prepared in the Foundation;

iv) Two sets each of 26 science – related books purchased by Foundation from Urdu Science Board and

v) One Solar Cooker per school.

Phase – II of the programme has been initiated this year, involving over two hundred schools.

3. Science Poster Project

Pakistan Science Foundation prepares packages of posters on science – related themes for free distribution to High Schools throughout the country. The attractive pictures in colour illustrating scientific themes help greatly in promoting awareness of science and of the environment.

The project was initiated in 1987. Each year a set of 10 posters is prepared under direction and supervision of Dr. M.D. Shami. Samples of Science Posters accompany this application

4. Funding for Science Fairs / Exhibitions

PSF collaborates with Boards of Intermediate and secondary Education to organize annual Science Fairs/ Exhibitions for students (both boys and girls).

Twenty-one such events were assisted financially by the Foundation over the last ten years.

5. Planetarium Shows

Using portable planetaria, the Foundation arranges Planetarium Shows in schools to instruct students in celestial phenomena (Solar System, Seansonal Changes, Movements of Planets, Arrangement of Constellation and Galaxies, etc.) to arouse their interest in Science.

A commentary for the Planetarium Show was prepared in the national language under the direction and supervision of Dr. M.D. Shami and has been recorded in his voice for Planetarium viewers. (Sample tape being sent with application).

6. Preparation of Popular Science Literature in the National Language

Under the direction and supervision of Dr. M.D. Shami, the Foundation prepared the following science – related literature for free distribution. It has already been widely distributed.

(Five copies of each publication are being sent with this application)

PSF Popular Science Publications		English Translation of Title
i)	Leaflet	Portugese Man of War
ii)	Leaflet	Mushrooms
iii)	Leaflet	Baluchitherium
iv)	Booklet	World of Stars
v)	Publication for Science Clubs	Projects for High School Science Clubs

The last point (v) contains step-wise instructions in both English and Urdu for carrying out Science Projects.

7. Science Slide Shows

A programme of Science Slide Shows on a variety of themes has been prepared under direction and guidance of Dr. M.D. Shami. The show sections on :

		No. of Slides
I)	Dinosaurs	21
ii)	World of Stars	51
iii)	Fishes of Pakistan (Karachi beach)	57
iv)	PSF Science – Posters	33

carry a synchronized commentary in the national language in Dr. Shami's voice.

8. Science Film Shows

The Pakistan Science Foundation has established a Library of highly interesting and informative Science Films including Britannica Films and Films from the National Film Board of Canada, the Allama Iqbal Open University and USIS. These films are taken to schools and screened for students.

For one of the films, "Universe Beyond the Solar System", commentary in Urdu was prepared in voice of Dr. M.D. Shami.

9. Science Poster Contest

The Foundation in collaboration with Boards of Intermediate and Secondary Education organizes Science Poster Contests among High School Students (both boys & girls) at the level of each Board. The best three posters selected by each Board are awared cash prizes and are also included in an Inter-Board Competition at the national level. Cash prizes are awarded also to winners in the Inter-Board competition.

10. Free Distribution to Schools of Popular Science Magazines (National Language) and Science Encyclopedia.

For over three years the Foundation has been providing the popular science magazines 'Jadid Science' and 'Science Bachoon Key Liye' to 460 schools, many of which are located in remote areas of the country.

Other science books, including Science Encyclopedias have been donated from time to time.

11. Science Essay Competitions

Cash Awards are given by PSF and prizes in Science Essay Competitions organized by different agencies, such as Boards of Education.

12. Science Quiz Competitions

PSF provides cash prizes for Science Quiz Competions organized in Schools and Colleges.

13. Popular Science Lectures

Pakistan Science Foundation arranges popular science lectures every month. Scientists/Educationists who are invited to speak express themselves in non-technical language for the benefit of the mixed audience, comprising scientists, scholars, students, and the general public. The lectures are presided over by Dr. M.D. Shami who also addresses the audience at the concluding session.

14. Development of Pakistan Museum of Natural History (PMNH)

The only one of its kind in the country, PMNH was developed through the efforts of the Pakistan Science Foundation under the guidance of Dr. M.D. Shami. It has four main sections relating to Botanical Sciences, Zoological Sciences, Earth Sciences and Designing respectively. Presently located in a rented building, the Museum's permanent building is uder construction at a cost of Rs. 80 million. The Museum is visited by many hundreds of visitors each week including students from schools and colleges. The Museum has been developed through the Foundation's own resources and expertise.

15. Talks / Speeches / Addresses relating to science, including Science Popularization.

Dr. M.D. Shami lectures extensively on science, including science popularization, to schools, colleges and general audiences. He also gives interviews to radio and newspapers, in which he elaborates on science promotional needs of the country and programmes of the Foundation.

Over the last 10 years he had participated in some 300 lecture/discussion/ interview programmes related to science and science promotion. The prgrammes were held in different parts of Pakistan. They included inaugural addreses delivered by Dr. Shami on the occasions of Science Fairs, Science

Exhibitions Summer Schools for Talented Students, etc.

Ten specific addreses are detailed below by way of illustration :

Talk/ Lecture/ Address

Delivered by Dr. Shami		Date
i)	Opening Address at the Science Fairs at Lahore	23.1.1983
ii)	Opening Address, Peshawar University Students Union Office, Peshawar.	31.01.1983
iii)	Lecture on science & Technology in Pakistan three days conference at Islamabad	20.12.1985
iv)	Opening Address on Science in service of Humanity, 23rd National Science Conference, at Punjab University, Lahore	28.12.1985
v)	Opening Address on Science Fair, at Hyderabad.	6.11.1986
vi)	Address at PMNH opening ceremony at Islamabad	16.4.1986
vii)	Lecture on Importance of Science Education at Elaf Club Lahore	3.9.1986
viii)	Opening Address on Pakistan and Science on Azad Kashmir Science Week, at Azad Kashmir.	23.4.1987
ix)	Opening Address on 6th Science Exhibition, at Quetta.	11.10.1987
x)	Address on opening Ceremony of Science Caravan, at Islamabad	15.11.1987

16. The Foundation has submitted a proposal relating to a UNESCO/ UNDP sponsored project entitled "RAS/86/090 – SUPPORT TO FIELD LEVEL DEMONSTRATION AND TRAINING UNITS OF SCIENCE AND TECHNOLOGY: A COMPREHENSIVE PROPOSAL INVOLVING NON-URBAN SECONDARY SCHOOLS"

A copy of the proposal accompanies this application.

If implemented, the proposal would involve large-scale expansion of the Foundation's Science Clubs Programme in non-urban areas. So far, positive response has been received for the Foundation's proposal from the sponsors.

17. Collaboration with Adventure Foundation and Agha Khan Foundation

Pakistan Science Foundation has collaborated with Adventure Foundation, Pakistan, and Agha Khan Foundation, Pakistan, to conduct programmes involving Pakistani and foreign youth in natural science projects under the expert guidance of scientists from the Pakistan Museum of Natural History (PMNH).

18. Funding for Summer/Winter Schools in Science for Talented Higher Secondary Students

The purpose of these schools in to acquaint the students about the role of Basic and Fundamental Science in national development. Outstanding scientists, educationists and research workers are invited to deliver lectures, with special relevance to latest developments in their own areas of interest. These residential schools lasting for 2 to 3 weeks, also provide opportunity to the students for informal discussion with experts and each other.

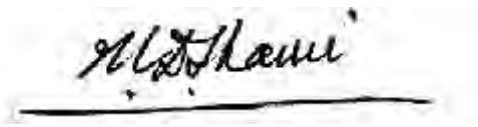
19. Science Corners

PSF offers help in the form of exhibits and expert guidance to educational institutions interested in setting up miniature Museums, or SCIENCE CORNERS of their own. The emphasis is on the natural wealth of the area.

The launching of the above mentioned programmes for science popularization through Pakistan Science Foundation, bear testimony to Dr. Shami's dedicated and devoted efforts for science popularizaiton in Pakistan.

The Foundaiton is the only organization in Pakistan which has embarked upon popularization of science at the grass roots level in the country on such a large scale.

Concluded



(Prof. M.D. Shami)

PRESENTATION OF THE KALINGA PRIZE FOR 1990
Unesco House
Paris, 28 October, 1991

Acceptance Speech
by
Prof. Dr. Misbah-ud-Din Shami
Sitar-i-Imtiaz
M.Sc., Ph.D., F.I.A.S., F.P.A.S., F.P.I.Ch.E., F.C.S.P

His Excellency Director General, UNESCO,
Excellencies,
Ladies and Gentlemen,

I consider it an honour and a privilege to express my gratefulness to UNESCO for recognizing my humble services in the popularization of science. I am aware of the long list of world-famed scientists on whom KALINGA Prize has been bestowed in the past, and this encourages me to continue making my small contributions in whatever position I happen to be . It is in fact an honour for my country, and also for the institutions where I studied and the Organisations which I served.

I must laud the role played by Kalinga Foundation Trust of India for Popularisaiton of science by instituting this international award. The Prize is undoubtedly an incentive to scientists, educationists, scholars and writers to work for the promotion and popularization of science at the global level. I take this opportunity to complement UNESCO in its endeavors to promote and encourage science and education through different awards such as the present ones.

To-day I am obliged to refer to the International Congress on 'Science and Technology Education and National Development' convened by UNESCO at Paris in 1981 from 23rd November to 2nd December, which I had the honour to attend as a single principal Delegate from Pakistan. It was during this Congres that I was motivated to make efforts for the promotion of science in society. I thought of bringing about a change in the attitude of my science starved country. At that time I was serving Pakistan Science Foundation as its Chairman. In accordance with the Charter of the Foundation, I chalked out as many as 17 programs to create awakening among the younger generation to the importance of science not only as an economic necessity but also as a religious imperative and cultural compulsion. These included, among others, Science Exhibitions and Fairs, Portable Planetarium Shows, Science Posters, Mobile Science Exhibition, Summer School for Talented Science Students, and establishment of Pakistan Museum of Natural History. I am glad to say that by initiating

these activities I succeeded, to a great extent, in taking science and the culture of science to the door-steps of younger generation.

Ladies + Gentlemen!

Of late, popularization of science has assumed new dimensions because science has permeated every sector of human life. Science is not a mere instrument of military power or industrial growth; it also broadens the general understanding of the people about the purpose of life. It has also effected a cultural transformation of man all over the world. It is rather unfortunate that inspite of having virtually abolished time and space, science has not been able to bridge the gap between the minds of men. The distance between the haves and have-nots continues to widen as ever. Popularisation of science as a culture, therefore, would have to be more extensive and unifying.

As a student of science, I am distressed to find that the community of scientists is being treated as a mere merceonary; they have no say in directing the course of events, neither in the international arena nor in their own countries. I would therefore take this opportunity to request my colleagues to reflect whether popularisaiton and promotion of science is possible without the scientist having sufficient power. He must have authority commensurate with what he is able to conceive and invent, and be able to project science as an equitable and humane culture. Probably, those who conceived the idea of UNESCO were aware of interaction of science, education and culture.

Before I conclude, I must thank the Director General UNESCO and the International Jury for selecting me for this award.

Kalinga Laureate for Popularization of Science – 1991

Prof. Radu Iftimovici, Romania

Radu Iftimovici
A Brief Biographical Profile

Dr Radu Iftimovici, from Romania, who is chief scientific researcher at the Institute of Virology of the Romanian Academy, has a long-standing interest and involvement in the popularization of science. For nearly 30 years, he has been engaged – through books, articles, television and cinema films, radio programmes and theatre plays – in propagating scientific and technological culture, extending from his field or special competence to a number of neighbouring scientific fields.

He is currently one of the leading authors of science popularization literature in Romania. He has written eleven books dealing with topics such as viruses, test-tube babies, contemporary biology and medicine, as well as the lives of eminent scientists and historians. His books and stories are entertainingly written while scrupulously respecting the scientific facts. Through his work, Dr Iftimovici has succeeded in communicating to a vast public in Romania the main problems and issues of contemporary biology and medicine. He is a member of the Union of Writers of Romania.

In addition to writing scientific books and articles, Dr Iftimovici is also a well-known playwright in his country. The theatres of Romania have performed five of his plays, which recount the life and work of such scientists as Niels Bohr, Enrico Fermi and Pasteur. He has furthermore been responsible for producing from 1972-1988 a TV series of forty-two episodes, broadcast by Romanian television, on the life and work of famous scientists.

In addition to all these science popularization activities, Dr Iftimovici is also a well-known playwright in his country. The theatres of Romania have performed five of his plays, which recount the life and work of such scientists as Niels Bohr, Enrico Fermi and Pasteur. He has furthermore been responsible for broadcast by Romanian television, on the life and work of famous scientists.

In addition to all these science popularization activities, Dr Iftimovici has pursued his work as a virologist. In particular, he has carried out fundamental research in the field of virology at the Pasteur Institutes in Paris, Tunis and Athens and is currently head of the Laboratory of Viral Pollution at the Romanian Academy's Institute of Virology.

I extend my sincere congratulations to the two winners of the 1991 Kalinga Prize, Dr Sehgal and Dr Iftimovici, whom I am happy to present with the diplomas and cheques that accompany the Prize, together with the UNESCO Niels Bohr medal.

Kalinga Laureate for Popularization of Science – 1991

Dr. Narender K. Sehgal, India

[Born: 7th November, 1940, Lahore (now in Pakistan) ….]

All the Science Communicators in the field – editors, writers are all self made people. Most of them have had no formal training.

…Dr. Narender.K. Sehgal

Narender K. Sehgal
A Brief Profile

Widely known and recognized as the architect of India's internationally acclaimed Science Popularisation Programme, Dr Sehgal retired (in November 2000) as Adviser to the Government of India in the Department of Science and Technology. Dr Sehgal was the founder editor (as well as printer and publisher) of the quarterly "Scientific Opinion" during 1972-76 and also an invited contributor during that period to the international popular science weekly "Nature" (published from London). Dr Sehgal has contributed invited articles to a large number of magazines and newspapers all over the country, both in Hindi and English. For his writings and work in the area, he was awarded UNESCO's Kalinga Prize for Science Popularisation in 1991. For his popular science writings, he was also awarded one of the inaugural Fellowships of the Indian Science Writers' Association in 1993.

Dr. Narender K. Sehgal was born on 7th November, 1940 in Lahore (now in Pakistan), has had a brilliant academic career capped with a 1969 PhD in Particle Physics from University of Wisconsin at Madison, Wisconsin, USA.

Dr. Sehgal successfully completed one year Post Graduate Course of the Atomic Energy Establishment (now known as Bhava Atomic Research Centre) Training School in August, 1961 in Physics and was appointed as a Scientific Officer in the Theoretical Reactor Physics Division of BARC. Dr. Sehgal worked there for two years and proceeded to USA to do his Master's & PhD Degrees.

Dr. Sehgal has done Research in Theoretical Reactor Physics & Particle Physics. He taught Physics at the Somali National University in Magadiscio, Somalia (East Africa) where he was Professor of Physics for two years during 1976-78 before returning to India to join the Space Application Centre of ISRO in Ahmedabad as a Visiting Scientist. There he stayed from 1978 to 1981 and joined Department of Science & Technology, Government of India to lead Indian Council for Science & Technology Communication and Vigyan Prasar, where he remained till his retirement in November, 2000 as Advisor to Government of India.

Dr Sehgal is presently working as the Chairman of the National Organising Committee, Year of Scientific Awareness-2004, A Project of Department of Science & Technology, Government of India.

Dr. Sehgal is widely known and recognized as the Architect of India's Internatioally acclaimed Science Popularisation Programme.

Dr. Sehgal conceived, formulated and coordinated the implementation of countrywide projects and programmes, which have become major and pioneering milestones in the field of Science Communication; The "Bharat Jana Vigyan Jatha" of 1987; The Annual National Children's Science Congress held since 1993; The Radio Serials 'Vigyan Vidhi' and 'Manav Ka Vikas' (Human Evolution) – done in 16 Indian Languages & Television Serials 'Kyon Aur Kaise' (12 parts) and 'Kudrat Nama' (27 parts) to name only a few.

Dr. Sehgal was instrumental in having the National Science Day (February, 28) instituted in the country and in the formation of the All India People's Science Net Work in 1988 and National Council for Science & Technology Communication Net Work in 1990, that have been spearheading the People's Science Movement in India.

Dr. Sehgal was also the Chief Editor of the Bi-lingual (Hindi & English) Monthly News Letters 'National Council for Science & Technology Communications' from 1988 to November, 2000 and 'Dream – 2047' from its inception in 1998 till November, 2000 respectively.

Dr. Sehgal has given innumerable talks and has been interviewed on All India Radio from its different Kendras all over India on numerous occasions. He has also been interviewed on almost all Television Channels in India over the years especially in connection with occasions such as those of the Total Solar Eclipses of 1995 & 1999 and also during the incidents such as the one's relating to the 'Ganesha Drinking Milk' and 'Raman Pilai's so called Herbal Petrol 'hoax'.

Dr. Sehgal has received a number of National and International Awards. He has received the coveted UNESCO's 1991 KALINGA PRIZE for Science Popularisation (jointly with a Romanian, Mr. Radu Iftimovici) – the only International Award available in this field. The Prize was instituted way back in 1952 by our legendary leader " BIJU PATNAIK" through Kalinga Foundation Trust & UNESCO for Popularisation of Science.

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Dr. Narender K. Sehgal's Career as a Popularizer of Science

Though he has been writing and getting into print since he was thirteen, his sustained efforts in science popularization and science communication date back to the early seventies.

1. During 1972-76:

(a) He founded and single-handedly brought out and edited a quarterly journal called **Scientific Opinion** for serious discussion on issues and problems relating to science, technology, education, society and development. **Scientific Opinion** was among some of the early pioneers responsible for laying the foundation of (written) science communication in the shape and state it is today in India.

(b) He was invited by Editor of **Nature** (London) in early 1974, to contribute pieces on developments in Indian science, technology and education as and when he felt like; this was a standing invitation. Pieces contributed by him appeared in **Nature** during the period 1974-76. In fact, regular coverage in international science magazines, of developments in Indian science and technology could in a way be traced to pieces contributed by him to **Nature.**

(c) During 1974, at the height of the oil crisis, he was invited to contribute the article from India, in a special issue of Nature on Energy ("Energy Problems Facing India", Nature (**249**, 710; 1974); and errata in Nature (**251**, 364; 1974); a corrected version appeared in Scientific Opinion, November 1974 issue.

2. During his two years in Somalia (1976-78), his popular science writing was less frequent; even so, he contributed an invited article on the state of Indian science & technology to an American Almanac (July 1977).

3. During the time he spent at the Space Applications Centre (1978-Dec 1981), he worked with a group which had pioneered the use of television as a tool for development. During this period, a good deal of his writing went into background papers for seminars, approach papers, a national paper from India for the Second UN Conference on Peaceful Uses of Outer Space. A report on a technology transfer study in broadcast communication appeared in a UNESCO monograph on developmental communication.

4. The period from 1982 onwards has been fully devoted by the candidate to science popularization in India in a number of ways.

(a) Attempts to popularise science in India have a long history, going back many years before independence. But until very recently, these have all been isolated attempts, limited largely to popular science writings, and passive programmes broadcast over radio and television – invariably by employing the English language. There were a few hounourable exceptions. In spite of the long history, however, all these efforts were not amounting to much in terms of any perceptible or tangible impact nationally. For that to start happening, science popularization efforts were required to be pursued far more vigorougly and stridently, and on a very massive scale. **It is in this context that sustained and untiring efforts of the candidate assume great significance.**

(b) In recent years, there have been some major developments on the Indian S&T popularization scene which , for the first time, promise to turn dreams into realities. In each case, Dr. Narender Sehgal has played a key or central role in bringing it about; making it happen! Here are a few examples:

(i) India's unique, exciting and massive experiment in Science communication – NCSTC's **Bharat Jan Vigyan Jatha (BJVJ)** – which was conducted during September-December 1987 throughout India, and which directly reached over a crore of people. Central to the BJVJ was an all India science

march in which five regional jathas began simultaneously from five different corners of the country around October 2- Srinagar, Malda, Aizawl, Madras and Sholapur – and after traversing almost all States/UTs of the country (some 25000 Kms) making over 500 stops, they all culminated in a big BJVJ rally at Bhopal on November 7, 1987. Prior to , during and after the Jatha, a large number of Indians were involved in scientific and science-based activities promoting the basic values and the method of science and conveying the message that it was possible for people to use to their advantage the principles, the knowledge and the tools that science & technology have provided. This was sought to be done through popular lectures, slide shows, film shows, exhibitions, discussions, demonstrations of scientific toys/kits and dramatic performances based on scientific themes using folk forms and so on. It was clear from the enthusiasm generated by the BJVJ everywhere that people are very receptive and eager to discuss, learn and improve their lot through the application of S&T and its methods. Such an event, with no parallel anywhere in the world, could have simply not taken place, without the candidate.

(ii) The unique and highly commended 13-part radio-serial on the **Method of Science** which was broadcast during June – October 1989 from almost all **AIR** stations on Sunday mornings between 8 & 9 A.M, in all major Indian languages. Each episode of the serial was of 18-20 minutes duration and built around an epoch in the story of evolution of man. Wall-charts and kits (again in all major Indian languages) were provided before and during the broadcast to 140,000 children of 10-14 year age group who had registered themselves with AIR stations in their respective regions.

(iii) The unique and very widely acclaimed 13-part film- serial on the history of science and technology on the Indian sub-continent **Bharat ki Chhap** Which was broadcast on Doordarshan's national network on Sunday mornings during April – July 1989.

(iv) **Networking of Agencies**

After months of hard work and consultations, 36 voluntary and other agencies, spread over the country engaged in science popularization work, decided to come together to form a voluntary association called the 'NCSTC-Network'. At its first General Body meeting, Dr. Narender K.Sehgal was unanimously elected Chairman of this association. The basic idea behind the formation of this Network is to develop a mechanism for doing things on a large enough scale to make a perceptible enough change and impact. A number of common, coordinated programmes have already been chalked out and are under implementation.

(v) Dr. Sehgal's editorials in **NCSTC Communications,** the monthly newsletter of NCSTC (now in its third year) are a treat to read and are followed with interest by many of those who are engaged in science popularization work in India.

There are many more exciting and unique projects underway, on the anvil and being planned by NC, under Dr. Sehgal's guidance and leadership, which promise to reach large numbers of people in all our States, districts, blocks and villages, with science communication activities.

It is his missionary zeal and total dedication to his work and through it to the cause of India that single Dr. Sehgal out as a pioneer.

"For a hungry man when you talk about Science, it does not involve giving him roti, he would not be interested."

….. Dr N.K. Sehgal

In India, we have a very strange situation and also a very challenging one. If you want to spread Science over a large area, there is no way that you can do it in English.

….Dr. N.K. Sehgal

Kalinga Laureate for Popularization of Science – 1992

Dr. Jorge Flores Valdes, Mexico

[Born: 1st February, 1941 ...]

The Physics is wonderful and if at this point of my life they returned to ask to me, like when it was in sixth degree of Primary, what I want to be, it would say that Physical"

...Jorge Flores Valdes

BIOGRAPHICAL DATA
DR. JORGE FLORES

June, 2007

Jorge Flores was born in Mexico City, Mexico, on February 1st, 1941. He obtained a bachelor's degree in 1962 and a Ph. D. degree in Physics in 1965, both degrees from the Universidad Nacional Autónoma de México, UNAM (National University of Mexico). From 1965 to 1967 he was a postdoctoral fellow at Princeton University; in 1969 he worked at the International Centre for Theoretical Physics in Trieste and in 1970 he was visiting professor at the Université de Paris (Orsay).

He published his first paper in the journal Nuclear Physics A in 1963. His theoretical work in nuclear physics continued for at least twenty years, using methods of group theory as well as statistical ltheory. In 1971 he introduced with Oriol Bohigas what is called the Two-body Random Hamiltonian Ensemble (TBRE) which is used nowadays in many branches of physics. The paper where the TBRE was invented has received more lthan 130 citations in the scientific literature.

Later on, in 1981, a review paper was published in Reviews of Modern Physics, the physical Journal with the largest impact factor. The paper, called Random Matrix Physics, deals with the statistical properties of nuclei and other quantum system. At that time the subject of quantum chaos became very popular, and this paper became a classic. It is still cited today, having received more than 1,100 citations.

In 1985, after the large earthquake that destroyed many buildings in Mexico City, he became interested in understanding the strange seismic response of this city, which is built, as many other cities around the world, on top of soft terrains. Together with Octavio Novaro and Thomas Seligman, the group used the mathematical techniques they had developed to analyze quantum systems to formulate a model for the seismic response of sedimentary basins. The paper was published in 1987 in the prestigious journal Nature; the front page of the corresponding issue was dedicated to this article. Dr. Flores went on publishing on seismology, using his model, which up to the present seems to be the only plausible explanation of this disastrous effect.

In the year 2000 he established a laboratory to study the vibration of elastic systems. Together with a group of experimental physicists he has produced several interesting results on the properties of vibrating rods. The last paper, published in 2006 in Physical Review Letters, dealt with the elastic analogues of a quantum mechanical effect. This seems to be an interesting result.

Since his first research paper in 1963, he has published 85 articles in the best international journals. These papers have received of the order of 1950 citations in the scientific literature.

Dr. Flores has occupied several administrative positions since 1974, when he was appointed director of the Instituto de Física of UNAM. he directed the Institute until December, 1982, when the president of Mexico appointed him as Under Secretary for Higher Education and Scientific Research of the Ministry of Education.

From 1989 to 1997 he was in charge of Universum, the science museum of UNAM, and from 1998 to 2006 he was director of the Centro de Ciencias Físicas, a research center of the National University located in Cuernavaca, a town not very far away from the capital city of Mexico.

Dr. Flores was director of the Revista Mexicana de Física from 1969 to 1973. He was president of the Mexican Physical Society (1973-1975), of the Mexican Academy of Sciences (1976), and the first president of the Sociedad Mexicana para la Divulgación de la Ciencia y la Técnica, a society dedicated to the popularization of science.

Jorge Flores has been awarded with several prizes : the Science prize of the Mexican Academy of Science in 1972; the Research Prize of the Universidad Nacional Autónoma de Mexico in 1988; the Alfonso Pruneda Prize of UNAM in 1991; the Joan Antoni Samaranch Prize of the Barcelona Olympic Games in 1992; **the Kalinga Prize for the Popularization of Science also in 1992,** and in 1994 the National Science Award, the highest recognition to a scientist from the government of Mexico.

His interest in the popularization of science stated when he returned to Mexico after his two-year work in Princeton. In 1968, Luis Estrada, who also won the Kalinga Prize, formed a group of physicists to found a popular science journal, Física was its name. The first issue of Física appeared in December of 1968. A year after, the name of the journal was changed, to make it of a more general character. Naturaleza was the new name, and was published during 15 years. Due to this publishing effort, not common in a developing country, Luis Estrada, the director of Naturaleza, was awarded with the UNESCO prize. During these years, Dr. Flores published 35 papers in Física and Naturaleza. In other journals and newspapers he has written another 65 articles, devoted to explain science to the general public. That makes a total of 100 articles published on this subject by Jorge Flores.

Dr. Flores has also written 18 books (in Spanish), four of which are textbooks, three on physics and one on calculus. The other books deal with different aspects of the popularization of science. Altogether 220,000 copies of these books have been produced and mostly sold. In 1987 he was invited by the Fondo de Cultura Económica, the largest publishing house in Mexico, to be a member of a committee who was in charge ofdesigning a series of science books dedicated to young readers. La Ciencia desde México (Science from Mexico) appeared in September of that year, when the first three volumes of the series were published, one of them written by Flores. The subject of the book was the magnetic monopole, an elusive not yet discovered elementary particle. This was the first of a series of four books, a series which he called La Gran Illusión (The Great Illusion) of which 1 36, 000 copies have been published in several editions.

Besides publishing these volumes in this series of popular books, which by the way changed its name to La Ciencia Para Todos (Science For Every One), he has been a member of its editorial committee since 1987 up to the present. Along these twenty years, 211 different titles have been published, with several millions of copies sold, not only in Mexico but also in the United State, with its large Hispanic populations, and in other Latin American countries. This means that one volume has been published every month during 20 years. **This makes La Ciencia Para Todos the largest series of popular science books in the world.**

In 1982, when he was Under Secretary of State, he organized a series of lectures devoted to children. These lectures took place, every Sunday, in the Technological Museum of Mexico City. A scientist was invited to produce an interactive scientific show dedicated to children. Experiments and games, in which the young people participate, were enthusiastically organized by many research scientists. In 1983, the program, known as Domingos en la Ciencia (Science Sundays), was also organized in other cities of the country. Two years later there were a total of 27 cities with the program running every week. In Mexico City, Dr. Flores attended most of the lectures for the ten years that he was the director of this program.

When the tenth anniversary was celebrated, he left the leadership of the program to a group of scientists. The program is still alive and on December 5th 2007 it will become 25 years old. More than 5000 lectures have been delivered in more than 50 cities in Mexico. At least 500,000 kids and their parents have attended then.

However, the most important task in the popularization of science that Jorge Flores has done is the construction of three interactive science centers. In 1989 he was appointed director of the Centro Universitario de Comunicatión de la Ciencia, with the explicit command to build the science museum of UNAM. In order to design it a group of university scientists and another one formed by technical experts were formed. In1990 the first interactive exposition was inaugurated in a subway station. In 1991 a large one Ciencia y Deporte (Science and Sports), was opened and operated during one year. For the organization of this event, Dr. Flores received the Joan Antoni Samaranch 1992 Prize given at the Olympic Games in Barcelona.

From 1990 to 1992 other 37 temporary expositions were held in several places around Mexico City, in which the exhibits were analyzed from several points of view : educational, mechanically and esthetically. Therefore, 39 of these events took place before the inauguration of UNIVERSUM, as the science center was called, occurred on December 12th, 1992. The museum is very large, in fact one of the largest interactive science centers of the world, with an area of 23,000 square meters. The day it opened at least 500 exhibits were in operation; today it has more than 800.

In the 15 years that have elapsed since its opening. UNIVERSUM has received almost 10 million visitors, being the third museum in Mexico regarding attendance. Thousands of lectures, workshops, shows,even theater and musical events have been organized in UNIVERSUM, many of them by Dr. Flores himself. As a matter of fact, the museum is in more than one sense the house of Mexican science. It has also organized 150 temporary exhibits in many cities of Mexico.

Dr. Flores was the director of UNIVERSUM until October 1997. In 1996, an abandoned old church in downtown Mexico City was given to him so that another science center could be established there. This time a single theme was developed : the light. In the Museo de la Luz (Museum of Light) around 90 interactive exhibits deal with the subject of light from different viewpoints : optics, biology, technology, even art. The museum is rather small with an area of 900 square meters, but the colonial church in which it is, makes it spectacular.

A third museum was also built under the direction of Dr. Flores. This one now had to do with our planet and its geology. It was built in the cellar of the geological museum of Mexico City, in a beautiful building constructed in 1906. It is not large but complements rather nicely the collections of the old museum. The inauguration of this permanent exhibition took place in July, 1997.

The last important work in the popularization of science that Jorge Flores has done was the construction of an exhibition dedicated to quantum mechanics. It was called EXPO Q and is unique, in the sense that no other science center in the world deals with lthis difficult subject. EXPO Q is a permanent exhibition in UNIVERSUM.

In short, Dr. Flores has written 190 papers and 18 books. he has delivered around 500 lectures on scientific subjects in many countries and has coordinated the construction and operation of three science museums.

Kalinga Laureate for Popularization of Science – 1992

Professor Peter Okebukola, Nigeria

[Born : February 17, 1951, ILESA, Nigeria...]

I have the fire of Popularization of Science aglow in me indeed. On a daily basis I make an effort to serve Science to People.

...Peter Okebukola

Higher Education is the key to Africa's development.

…Peter Okebukola

Professor Peter Akinsola OKEBUKOLA
A Biograpical Profile

Professor Peter Okebukola
DSc, Ph.D, FIAE, FSTAN, GIOH, JP
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Professor Peter Okebukola was born in Ilesa on February 17, 1951. He had his higher education at the University of Ibadan where he obtained his Bachelor's degree in 1973 followed by Master's and Ph.D degrees in Science Education in the same university. He had specialized training at the Massachusetts Institute of Technology (M.I.T.) , and Harvard University, both in Cambridge, USA. He now specializes in science, computer and environmental education. He serves on a number of international organizations as Consultant including UNESCO, UNICEF, The World Bank and the UNDP. He is currently the Executive President of UNESCO's African Netowrk for Innovations in Higher Education. In addition, Professor Okebukola is noted as the First African to win the prestigious Kalinga Prize for the Communication of Science, the First African Fellow and Member of the Board of Directors of the International Academy of Education whose membership is restricted to distinguished professors of education in the world, and the first African Member of the Executive Board of the International Association for Research in Science Teaching. He is also the African Representative and Member of the Board of Directors of the International Council of Associations for Science Education. He is a Fellow and Past President of the Science Teachers Association of Nigeria as well as of the National Association for Environmental Education. He has won several international gold medals in science and computer education and he is the Editor of or in the Editorial Board of 25 national and 18 international journals.

His research efforts have gravitated around five central themes – computers in education and e-learning, co-operative learning, metacognitive strategies in science education, environmental education, and eco-cultural influences on the learning of science concepts. There efforts have resulted in over 190 internationally published works and over 200 national and international conference presentations. Many of his publications can be found in the world's top 10 science education, computer education and environmental education journals.

Some of the major finding of his research in computers in education have appeared in Educational Research (U.K.), Journal of Educational Technology System (U.K.), the Nigerian Educational Forum and the Journal of the Science Teachers Association of Nigeria. Some of the articles on co-operative learning, metacognition, and eco-culture and science have appeared in the American Biology Teacher (U.S.A.), School Science and Mathematics (U.S.A.), Science Education (U.S.A.), Journal of Research in Science Teaching (U.S.A), European Journal of Science Education (U.K.), Journal of Social Psychology (U.S.A.), International Journal of Science Education (U.K.), International Journal of Educology (Austrialia), Research in Science Education (Australia), Human Relations (U.K.), Educational Research (U.S.A.), Journal of Social Psychology (U.S.A.), Journal of Biological Education (U.K..), Journal of Chemical Education (U.S.A.), Educational Perspectives (Nigeria), Journal of the Science Teachers Association of Nigeria, Instructional Science (Netherlands) and Research in Science and Technological Education (U.K.) among several others.

He has attended and made well-received presentations at local, national and international professional meetings. Of note are all the annual conferences of the Science Teachers Association of Nigeria since 1973, and the annual meetings of the USA-based National Association of Research in Science Teaching (NARST). He has also attended several NSTA National Conventions and Annual Meetings of the American Educational Research Association in the U.S. Other international conferences that he attended and made presentations took place in the U.K., Israel, Ghana, The Gambia, Kenya, Ethiopia, Mozambique, Senegal, Sierra Leone, Japan, France, Australia, Russian Federation, South Africa, Norway, Switzerland, USA, Ivory Coast, Belgium, Germany, Italy, and Burkina Faso.

His teaching career which began in 1970, included service in secondary schools as a teacher of biology , chemistry and physics, teacher of general science to students in a teachers' college; and a teacher of biology to college of education students and pre-degree biology students in a university. He also taught science education courses, research methodology, computers in education, data analysis/statistics and psychology of education to undergraduate and graduate students in the Lagos State University . As a Visiting Professor at the Curtin University of Technology, Australia, he taught statistics, research methods and science curriculum development to Ph.D students.

He is the immediate past Executive Secretary of the National Universities Commission. He is the Pro-Chancellor and Chairman of Council of Crawford University, Osun State University and The University of Education, Ikere-Ekiti. He has been awarded a number of honorary D.Sc degrees. He was the leader of the Academic Community to the National Political Reform Conference and recipient of the National Honour of the Officer of the Order of the Federal Republic- OFR.

❑

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   January 2003

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   January 2002

Kalinga Laureate for Popularization of Science – 1993

Mr. Piero Angela, Italy

[Born: 22nd December, 1928, Turin, Italy ...]

A natural wealth, like petroleum, is not worth anything without an invention like the one of the motor, that makes its use possible. As it says the proverb, “it is not possible to be rich and ignorant for more than a generation”. Therefore, I mean that the understanding of the social and economic power of the technology is one of the pillars on which always I have constructed my activity like publishing.

The second pillar is science like culture, that really is philosophy, is to say to the great questions on our past and our future. In this sense it is possible even to be arrived at disciplines like archaeology and the anthropology.

...Piero Angela

Piero Angela

Journalist, Scientific Advisor and Italian Pianist.

Biographical Profile

Biography

Music

Son of medical and anti-fascist Vercelli Carlo Angela, at the age of seven years began to take private lessons in piano and, later, began to develop his interest in jazz music. Twenty years in 1948 under the name **Peter Angela** is produced in various *jam sessions* in jazz-club Torino. In the same year was noted dall'impresario Sergio Bernardini, who invited him to play in the inaugural evening of Capannina of Viareggio. In the early fifties formed – along with drummer Franco Mondini-a musical trio, which alternatedf various contrabbassisti. The trio were joined often recall artists such as Red Nini Franco Pisano el'ex cornettista of Duke Ellington, Rex Stewart. Meanwhile recruited RAI, in 1952 stopped the music professional activities to devote himself to journalism.

Despite having abandoned since then the musical professional activities, Piero Angela remained a lover of *jazz,* albeit only as an amateur: it's not uncommon, when a transmission by him conduct touches topics in some way connected with the music, such as phenomena acoustic, to see him play piano and playing with jazz musicians known professionals.

Journalism

The first task within the state broadcasting was as a reporter and collaborator of Giornale Radio. With the advent of television (1954) Angela passed to Telegiornale, which was corresponding first from Paris, then from Brussels, from 1955 to 1968. Together with Andrea Barbato was the conductor of the first edition of Telegiornale National 13:30 and, in 1976, was the first conductor of TG2.

Influenced by the lesson documentary by Roberto Rossellini in 1968 Piero Angela produced a documentary series entitled *The future in space,* on the Apollo program (whose purpose was to bring the first astronauts on the Moon). Then began a long scientific dissemination activities, which in subsequent years led him to produce numerous broadcasts information such as *Destination Man* (ten episodes), *From zero to three years* (three episodes), *Where is the world?* (Five episodes), *In the darkness of light years* (eight episodes), *Survey criticism on parapsychology* (seven episodes), *In the cosmos in search of life* (five episodes).

In February 2006, on the eve of general elections the site of *Corriere della Sera* asked readers through a poll, which personality of journalism would have preferred to moderate the upcoming televised debate between two candidates premier, Romano Prodi and Silvio Berlusconi. Piero Angela, a journalist for the most scientific, surprisingly won the survey, surpassing a wide range of political journalists. Interviewed by *Corriere,* Angela declared not to be concerned for the post. A moderate two debates were then *Clemente Mimun and Bruno Vespa.*

Scientific Disclosure

At the end of the seventies, Angela decided to devote himself entirely to carry out programmes of disclosure : the first, 1981, was *Quark,* the first

television broadcast of this kind aimed at general audiences. The formula, still stands, was innovative: put in all the technological means available and the resources of television communication to make family topics: documentaries BBC and David Attenborough, the cartoons of Bruno Bozzetto used to explain the concepts more difficult, interviews with experts set out in the clearest possible language consistent with the complexity of the arguments, explanations in the studio. From the software-based sprang several *spin-offs,* some of which are still generatedf: Documentaries naturalistic *(Quark special and world Quark),* financial *(Quark Economics)* and political *(Quark Europe).*

It was the 1984 draft *Pills of Quark,* thirty-second spot on topics technical, scientific, educational, social, medical, broadcast at times variables on Rai Uno and still on the air . In the same year Piero Angela realized the first talk-show entertainment purposes mixed with popularizing science: the first six evenings live with the public, the Foro Italico, with personalities from the worlds of culture, science, entertainment and sport on stage to interact with the audience.

In 1986 and 1987 realized from Palazzetto dello Sport Turin in front of eight thousand spectators, the first two evenings on Rai Uno on the problems of climate: atmosphere and oceans, which was followed three television series that exploiting new technologies in the graphic representation through computer: a journey inside the human body (*The marvelous machine,* in eight episodes), in Prehistoric times (*the Planet of dinosaurs,* in four episodes), and space (*Travel in the Cosmos,* in seven episodes). These series, done with the collaboration of his son Alberto, were translated into English and sold in over forty European countries, American and Asian (Arab countries and China included).

Del 1988 was also *Quark Italian* documentary series in nature, environment, exploration, animal products and directed by Italians (including the same Alberto Angela, who created some documentaries in Africa).

In 1995 was born *Superquark* during which, on June 4, 1999, wee celebrating the two thousand episodes of the project Quark (and their subsidiaries). In that same year the *Special Superquark* evenings Monothematic on subjects of great interest social, psychological and scientific, and collaboration to television programme *Domenica In*…, in which Piero Angela was conductor of a space dedicated to culture.

Since 2000, finally, Piero and Alberto Angela are authors of *Ulysses*, a program aimed monographs on historical and scientific discoveries.

In parallel to the layman on television, Piero Angela has played and still plays, publishing activities, always informative . For a long time is curator of the heading 'Science and Society' on the weekly TV *Sorrisi e Canzoni,* and he was also curator and supervisor of the monthly *Quark,* which he himself founded in 2001 and subsequently dissolved in 2006 for lack of funds, which, along the lines dell'omonima television broadcast, was scientific issues in a manner accessible to the public. Piero Angela is also author of over thirty books, many of them translated into English, German and Spanish, with a circulation of more than three million copies.

In 1989 Piero Angela was among the founders of CICAP (which is a member actual), Association for the control of the paranormal, created to promote science education and the critical spirit, and to investigate the actual existence of the alleged paranormal phenomena.

During his long activities Piero Angela has received numerous awards in Italy and abroad, including the premium of Kalinga 'UNESCO on the merits in

popularizing science, and numerous *honorary* degrees (currently eight).

In 2000 Piero Angela was quoted in court for defamation by two associations homeopathic (FIAMO and SIMO in a civil case and a criminal), following the submission of *Superquark* of 'July 11, 2000 in which the accused was homeopathic medicine not have scientific basis, without giving the floor to supporters of this discipline. Angela was acquitted in both cases.

The January 22, 2008 receives during the *Night of Telegatti,* telegatto career.

TV Programs

The following programs were passed by nearly all Raiuno.

- The future in space (1968)
- Destination man (1971)
- From zero to three years
- Where should the world?
- In the darkness of light years
- Survey parapsychology (1978)
- In the cosmos in search of life (1980)
- Quark (1981), which has generated an entire family of transmission :
  - Pills of Quark (1983)
  - The world of Quark (1984)
  - Economics Quark (1986)
  - Quark Europe (1986)
  - Quark Special
  - Quark Science
  - Encyclopedia of Quark (1993)
  - Superquark (1994)
  - Special Superquark (1999)
- The marvelous machine (1990)
- Evening Ocean (1991)
- The planet of dinosaurs (1993)
- Travel in the cosmos (1998)
- Ulysses – the pleasure of discovery (only author on Raitre, 2000)

Honours

- **Grand Officer Order of Merit of the Italian Republic**

  May 26, 2004. The initiative of President of the Republic.

- **Gold Medal to praiseworthy culture and art**

  "Journalist and writer. It has the merit of having addressed the sciencfic language with a clear and precise, understandable to everyone". March 2, 1999

- **Order Commendatore al Merito della Repubblica Italiana**

  May 30, 2001. The initiative of President of the Republic .

Trivia

- In his residence in Turin, has a complete skeleton of Compsognathus longipes.
- In 2002 the magazine *Mickely Mouse* appeared the character Piero Papera, conductor of the transmission *Super Quack,* inspired by the famous journalist Turin.
- In his name was called the 'asteroid 7197 Pieroangela.

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- *Travel in Cosmos – Discovering the mysteries of the universe* (with Alberto Angela), Rai-Eri; Mondadori, 1999
- *Sharks* (with Alberto Angela, Alberto L. Recchi), Mondadori, 2000
- *The landscape that will be* (with Alberto Angela, Alberto L. Recchi), Mondadori, 2000
- *Monsters marine* (with Alberto Angela, Alberto L. Recchi), Mondadori, 2001
- *Alpha and Beta.* From the stars to intelligence, Mondadori, 2001
- *Journey in Science. From the Big Bang to biotechnology,* Mondadori, 2002
- *Awards & Punishment.* In search of happiness, Mondadori, 2002
- *The planet of dinosaurs* (with Alberto Angela), Mondadori, 2002
- *From zero to three years,* Mondadori, 2002 Mondadori, 2005 ISBN 8804514906
- *Did amerò forever,* Rai-Eri; Mondadori, 2005 ISBN 8804514906.
- *The challenge of the century* (with Lorenzo Pinna), Mondadori, 2006 ISBN 88-04-56071-1
- *Why do we need to do more children* (with Lorenzo Pinna), Mondadori, 2008 ISBN 8804580941

- It must have always a mind opened, but therefore not opened that the brain falls for earth.
- When one is ignited light bulb, s'inquina always from some part.
- For that it perceives a yield that it does not produce, is who produces a yield that it does not perceive.

...Piero Angela

Kalinga Laureate for Popularization of Science – 1994

Dr. Nikolay Nikolayevich Drozdov, Russia

[Born : 20th June, 1937, Moscow...]

Dr. Nikolai Drozdov - A Profile Par Excellence

Narrator of Programme "Animal Planet" (V mire zhivotnikh)

Nikolay Nikolayevich Drozdov is probably the most well known person in Russia. Not only is he a cult-figure among the older generations; he is also much loved by Russian youngsters. It is not often that parent's tastes coincide with the taste of their children. Nikolay N. Drozdov is an exception to that rule. He is a TV presenter, Doctor of Biological Sciences, Professor of the Moscow State University and Academician of the Russian Academy of Natural Sciences!

One can easily recognize the voice of Nikolay Drozdov, as we have known it since we were kids. His warmth and the Passionate interest that he shows to even the tiniest bug in the TV program "The World of Animals" are his trademarks. He has been the presenter of this program for over 30 years, and it continues to be very popular among the viewers. Generations have been raised on Nikolay Drozdov's animal tales, and he has gained lots of awards and recognition both in Russia and abroad, for these much loved programs and films, that he continues to make day by day.

Nikolay Nikolayevich is very active in public work. He is also a member of the commission of International Unity of Nature Protection, an author of over 20 books and one of a fifteen advisers to the General Secretary of the UN on ecology, a member of Academy of Science of New York and a member of International Research Club, an academician of Russian Academy of Television, a laureate of Golden Panda Award (also known as the Green Oscar) and the Kalinga prizewinner. He has traveled round the world on scientific vessels twice and took part in hundreds of expeditions. He is a dedicated vegetarian.

The love he feels for animals, the same love Nikolay Drozed feels for people. He gives the best he can to vulnerable people who find themselves in difficulties, especially children. Drozdov believes that if a baby feels loved, it is much more likely to become a good rounded responsible adult regardless of all the afflictions and struggles it would have come through. Therefore, Nikolay Nikolayevich does everything he can to protect them from suffering, as his life motto is **"All you need is to feel an urgent desire to help people in every way you can".**

Biography:

Nikolai Nikolaivich Drozdov was born on 20th June, 1937 in Moscow. While still studying in school, during summer vactions he used to tend horses in the horse breeding center in the Moscow suburbs. After completing school, Nikolai joined the biology department of Moscow State University named after M.V. Lomonosov. He completed the Biogeography stream under the geography department of MSU in 1963. In 1968, he presented his pre-PhD papers in Bio-geography. As of date he works in the Biogeography stream in the department of Geography at the Moscow State University. In the year 2000 he presented his research papers on "Animal planet and conservation of nature in the deserts of the world". In 2001, he was made professor of the department.

Nikalai Drozdov happens to be one of the most recognized scientists and respected techer in the Moscow State University. He gives lectures on ecology, ornithology, conservation of nature, the bio-geographic world & constantly invited to give talks in the schools & youth recreation centers sponsored by "Knowledge" (Znanie). As a researcher, far east, Kuril Islands, Pamir, Tyanshan Ranges, Karakum to name a few. During 1971-72, he underwent a ten month scientific course in the department of zoology at the Australian National University, Canberra. He travelled far and wide in Australia and published a book on his travels called" Flight of Boomerang". The book has been published 5 times so far.

Since 1968 till date – for more than 30 years he has been taking part in the popular television programme "Animal Planet" (V Mire zhivotnikh), at first as a narrator along with Alexander Mikhailovich Zguridi and since 1977 as anchor as well as author of the programme. Nikolai Drozdov is author and co-author of many tele and video films on nature and animals. In 1995, the programme "V mire zhivotnikh" was awarded the prestigious TEFI award as best in the educational and informative category. Drozdov was elected as member of Russian Academy of Television in 1996. As part of the group of mountaineers he conquered the Elbrus peark in 1979. He took part in a four month long UNESCO expedition on "conservation and rational use of resources in island eco systems" on the USSR Academy of Science's vessel "Calisto" and travelled through islands of Fiji, Tonga & Samoa in 1980. In 1993 & 1995, he took part in the expedition to North Pole on the Russian ice-breaker "Yamal" along North Sea route and also in the ship "Discoverer" along the coast of Alaska & Canada. In 2002, he took part in the expedition to the North Pole repeating the feat of Papalin's landing. Nikolai Drozdov is the author of about 200 scientific & popular scientific works, more than 20 books, text books and guides for students as well as teachers.

In 1989, Drozdov has been included to the distinguished list of leading ecologists and specialists in the field of environmental conservation of the world-UNEP's "Global-500". In 1992, he was awarded with "Golden Panda" (also, known as "Green Oscar") for his great achievements in the Bristol (UK) Film Festival on nature. In 1994, he was elected as a member to the international researchers' club known as Explores' Club. In 1995, he was awarded the UNESCO's "Kalinga Prize" for popularizing science and also , Albert Einstein's medal.

Nikolai Drozdov was elected member of the New York Academy of Sciences in 1995. During 1996-98 he was member of Supreme Council on sustainable growth at the UN General Secretariat. In 1998, he was awarded the honorary Diploma by the World Environment Fund for his achievements & efforts in conserving the environment in Russia and in the world.

He was elected as member to the Russian Academy of Natural Science & Russian Ecological Academy in 2001.

In his leisure time at home, Nikolai Drozdov loves to interact with animals. His pets include snakes, spiders, phalanxes & scorpions. Loves equestrian sport, skiing, bathing outdoors in ice cold water in winter, practices Yoga & for many years he is a vegetarian. His preferences in music are: Classical, romantic & folk music. He loves to play on guitar & sing in Russian & foreign languages. His wife, Tatyana Petrovna Drozdova works as a lecturer of biology in Moscow Artistic Palace for development of children & youth.

Nikolai Drozdov considers that his participation in the programme "The Last Hero" in 2003 as one of his greatest achievements." I never expected that I have to live for so long on a beach without food, without watch and telephone or without notebook. I, actually never felt discomfort without these amenities as I had gone through all these during my youth in numerous expeditions. It was only feeling of complete happiness. And my biggest achievement was that I shed 12 kilograms."

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"Internet- a great network that has overwhelmed the soul of human race. If this force can help creating kindness, wisdom & superior soul & intellect, then this could be the best thing that one can ever perceive. I am still in the process of learning it. Would like to get into this network & find the possibility to make this a better intelligent & fertile network which will bring people more happiness & fortune. The goal of internal should not be confined only to getting information, but also to spread happiness of human interaction".

...Dr. Nikolay Nikolayevich Drozdov

Dr. N. N Drozdov-An interview

From Russia with love

The Winner of the 1994 Kalinga Award on his Love for Nature and Views on Science Popularisation.

DR Nikolai Nikolaevich Drozdov, is a leading ecologist and presently associate professor of Biogeography at the Moscow State University. A sprightly man for his 58 years, his love for nature is apparent. So also his penchant to travel the world to observe and conserve the flora and fauna of different regions. India, he finds, compares well to the natural and climatic conditions of the deserts of former Soviet Union. This Moscow born biogeographist completed his doctorate in 1968 on the ornithofauna of the deserts of the USSR. He is a prolific writer, having authored 183 research articles and 23 books including a bestseller about his journey through Australia, The flight of the Boomerang.

For the last 23 years Dr Drozdov hosts a fortnightly television programme called in the world of animals, which has been compiled into a book. His six part television series Realms of the Russian Bear has also received wide acclaim. In 1992, he won the Golden Panda for outstanding achievement at the Wildscreen festival in Bristol.

He was recently in the capital to receive the 1994 Kalinga award for popularisation of science, instituted by the United Nations Educational Scientific and Cultural Organisation (UNESCO). Presented below are excerpts from an interview with Dr Drozdov in conversation with ***R Ramachandran and Radhika Singh.***

On his initiation as a nature lover

My parents raised me with an education that taught me to appreciate nature. My father was a professor of chemistry and he gave me and my brothers home education that included Latin, botany, zoology, paleontology and a host of other intersting subjects. As kids encouraged by our father, me and my brother penned down articles in Latin in a home magazine we called Man and Nature. In my younger days I read about David Livingstone who crossed Central Africa, Rudyard Kipling's stories about the jungle, Jim Corbett's adventures; and developed a fascination for the exotic things in nature. It is also why I chose to do my dissertation on deserts.

On being in India

In the Karakoum desert of Kazakhstan, day temperatures reach 47^0C. It is quite similar to Indian summers. In fact, south Turkmenia almost touches the north of India, so I am used to hot weather. But our camera team was not equipped to face the heat, so I have come alone. I shall return in October-November with the crew for some filming at Corbett and other places for our television programme.

On wildlife in Turkmenia

I was intersted in the snakes, in particular, and spent a long time observing and learning about cobras. The cobras there are different from those found in India. They have no spectacles on their back nor is the hood marked, but their defence

positions are the same. I taught myself to handle wild cobras by studying their behavioural limits. I'll tell you a secret-anything a cobra sits on, it won't bite, so your arm and hand is always safe. You just have to keep it away from your face to protect yourself, because the base of the teeth can cut your skin.

It is cruel to take out the poison glands as most snake charmers in India and elsewhere do, because the glands are located at the base of the jaw in a sensitive area, so that you almost kill the snake.

On his encounters with Romulus Whitekar and the Maharaja of Mysore

I visited him about 20 years ago, in 1975, when we filmed the snake park in Madras. He is a committed nature conservationist. Besides snakes, he also protects sea turtles. I recall accompanying him to the beach at night when the turtles come to the sea-shore in large numbers to lay eggs. The locals in the villages around hurriedly gathered there to pick up the eggs. Whitekar would patiently go to each villager explaining to them why they should leave at least, say 10, out of 50 eggs buried in the ground. That way they would be able to find more eggs the next season, else the turtles would no longer visit the same beach next season.

In Mysore, I met the Maharaja in 1974, his father had just died. There I visited the Yoga Institute and soon after turned vegetarian.

On birds of the desert

They have some intriguing adaptations to weather the heat. Some birds nest in the boroughs of rodents as it is so hot outside. Others make nests. Like the desert eagle that spreads its wings and sits, under which small birds like finches and sparrows make their nests to protect themselves from the sun. The desert eagles do not seem to mind as these birds are not their prey.

Birds like the sand grouse fly as far as 20 km to a pond they know for a drink of water and then fly back home. They have specially designed feathers which absorb three times more water than those of other birds. This is a surface adaptation that helps them attract water. The water in the wings is used to feed the chicks or wet the nest to cool it.

There are as many as 150 species of fauna in the desert, mostly birds and reptiles. The desert fauna has diverse environmental adaptations. The Turkmenian desert, for instance, is arid, drier and hotter as compared to Thar which has softer conditions.

On the Siberian crane and why it no longer migrates to India

The Siberian crane is seen at Baikal Lake and many islands in Siberia. It is listed as an endangered species and there is an on-going project in Russia to protect these cranes. I have high regard for Dr George Archibach, who is president of the International Crane Foundation and has been devoted to the study and conservation of cranes since childhood.

This year the Siberian crane has moved its wintering ground and I'm told huge flocks were spotted in China. It could be due to the shortage of water in Bharatpur. You must conserve their habitat and as soon as its wet enough they'II come back-don't worry about it.

Indira Gandhi was keen on conserving these cranes. I like this about India-enough people want to conserve and save the environment. I won't criticize other countries, but recall an incident which I found disturbing. In recent years, there has been a strong criticism of Richard Leaky, who has spent a lifetime committed to studying the remnants of early man, by the President of Kenya. Instead of supporting such a project, they are putting a spoke in it, simply because he is not a local. Similarly, my friends all over the world tell me of campaigns like the one in China to kill all the sparrows and flies.

On the role of low-cost Russian books in the popularization of science, and the non-availability of such books in India after the breakdown of the former USSR

Books in our part of the world have always influenced public opinion much more than in the west. In the former Soviet Union, a lot of publishing houses had government support and so were greatly encouraged. In Russia, we have a society for book lovers and a society for nature lovers, the latter is headed by a former Kalinga award winner.

After the formation of the CIS, the science budget is less than it was before. This is a dangerous trend. In fact, the budget is full of deficits. War in Chechnya, for instance has affected the budget, but the problem could be solved by economists if they work towards making the economy more market friendly.

The measures taken for science popularization have declined in the CIS, and there probably is more spread of superstition, astrology, belief in the supernatural etc, though I personally believe astrology is scientific to some extent too. But if you have read the original texts of Nostradamus, one cannot totally avoid the validity of predictions that have scientific explanations.

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Saturday 24 June 1995

Kalinga Laureate for Popularization of Science – 1995

Professor Julieta Fierro Gossman, Mexico

[Born : 22nd Febrary, 1948, Mexico ...]

“The Knowledge is a treasure, a human faculty that there is to take care of . We can translate the scientific concepts without altering its meaning. The things always can be explained of simple way”

…Julieta Fierro Gossman

JULIETA GOSSMAN IRON
A Biographical Sketch of An Extraordinary Woman

Julieta Fierro, is the 1998 winner of the Dorothea Klumpke-Roberts Award of the Astronomical Society of the Pacific, given for outstanding contributions to public understanding and appreciation of astronomy. Julieta Fierro is well known, to international astronomy educators, as President of the International Astronomical Union's Commission on the Teaching of Astronomy. She is an active participant in education conferences all over the world.

She was the 1995 winner of UNESCO's Kalinga Award, one of the most prestigious awards for the popularization of science. In Mexico and other Spanish-speaking countries, she has used all means available to promote public kunderstanding of astronomy, and has done it for all age levels, and for all segments of society. She is the author of 23 books - several of which are used nationally in public and school libraries - and dozens of pupular articles. She is a regular contributor to two of Mexico City's largest newspapers, and editor of the monthly magazine "Orion". She is regularly interviewed by the media, and appears on r adio and TV virtually every w eek. She has recently produced a series of TV programs for school children and teachers. She is avtively involved in four science centres, has advised and assisted many planetariums in Mexico, and has promoted and assisted many astronomy clubs. She was national co-ordinator for the 1991 total solar eclipse. She has given hundreds of public lectures, in Mexico and around the world. it is not surprising that, when the 200,000 students applying for admission to the Universidad Nacional in 1995 were surveyed about the scientists they knew, most answered that they had only heard of one - Julieta Fierro.

Julieta Gossman Iron, titular investigator of the Institute of Asronomy of the UNAM, professor of the Faculty of Sciences of the UNAM and member of the SMF, obtained the Prize Kalinga 1995. The Kalinga Prize is granted by UNESCO annually, from 1952, to the scientist who has distinguished itself more by his activity in the scientific spreading.

Between the awarded ones with the Kalinga prize there are Seven Nobel prize Winners : Louis de Broglie (1952), Bertrand Russel (1957), Karl von Frishch (1958), Konrad Lorenz (1969), George Porter (1976), Peter Medawar (1985) and Nicolai G. Basov (1986). This is the second time that grants the prize to a woman; in 1970 the Prize had been granted solely to North American anthropologist Margaret Mead. Jolieta Iron is the third person dedicated to astronomy that receives this distinction, in 1966, the Prize was granted to Paul Couderc and in 1967 to Fred Hoyle.

The Kalinga prize includes a medal, and a symbolic amount in cash. The prize is given by UNESCO in Paris in an official ceremony. Other two mexican physicists have obtained this distinction : In 1974 Luis Estrada and Jorge Valdes Flowers in 1992.

The work of spreading of Julieta Iron has been extraordinary, has published 19 books between which they excel Like approaching astronomy (National Advice for the Culture and the Arts, 1991) and the family of the Sun, along with Miguel Herrera Angel (Collection Science from Mexico, Bottom of Exonomic Culture 1989, with reimpresiones in 1991 and 1994). She founded

Orión in 1986, monthly bulletin of diffusion of the Institute of Astronomy of the UNAM, and since then Julieta Iron has been publisher and author of this bulletin; also she is Head of Diffusion of the Institute of Astronomy of the UNAM. She has been conductor of several programs of radio and has participated in numerous programs of radio and television. She writes regularly for the Excélsior and the Day and has dictated innumerable conferences of spreading in all the country. She has collaborated with exhibitions, scripts and conferences in diverse museums of sciences of Mexico and the foreigner and at the present time She is member of the Advisory Scientific Council of Universum.

Julieta Iron is vice-president of the Commission of Education of the Astronomical Union Internacional (1994-1997). In the General Assembly of the UAI, that will take place in Kyoto, president of this commission will be named (1997-2000). The UAI is the only international society of professional astronomers and groups approximately eight thousand astronomers of more than fifty countries.

Julieta Iron is member of the SNI and has been deserving to a Patrimonial Chair of Excellence of the CONACYT. The investigation area to which it has been dedicated is the interstellar matter.

In addition to the Kalinga Priuze, Julieta Iron has received the Prize of Spreading and Promotion of the Science of the Academy of Sciences of Third World 1992, and the National Prize of Spreading of Science 1993.

Manuel Peimbert Institute of Astronomy, UNAM.

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Scientific diffusion of Science and Activities

by
Julieta Iron
of the Main Directorate of Spreading of Science

Introduction

In this communication some of the reasons will be mentioned for which emphasis in the entailment with the industry and the informal education is important to disclose science in the UNAM doing. One will be the subject the evaluation and the necessity that a Coordination of Spreading of Science exists, a Prize National University in Popularización of Science as well as a masters in this discipline.

The conclusion will be that it is necessary to disclose science to increase the scientific culture in the population, that this not to only will be him useful but that it will contribute to him to please. Diversity of methods will be mentioned that between more and better the popularización becomes, using and subjects greater success will be had.

It is possible to indicate that in the UNAM half of the investigation of the country is carried out, in addition have some of the greater bibliographical heaps of the nation. The UNAM is not only responsible to create new knowledge, to protect it but also to spread it.

Why to disclose Science?

It is necessary to disclose science because it is part of the culture and a modern citizen needs to know on the investigations of border to be able to make better decisions. In individual it is necessary to popularize science between the scientists, in order to favor the multidisciplinary investigations. For the industry with the intention to fortify it, if the industrialists incorporate the new knowledge to their products will be able to innovate them and thus to produce greater wealth. It is necessary to disclose for the educational ones, with the objective of which they not only incorporate the new knowledge to his task but which they learn the average ways to transmit knowledge by more playful. These are only some examples of strategic groups for which it is worth the trouble to make spreading, the amount of other groups is enormous: housewives, young people, children, takers of decisions etc. She is worth the trouble to stop to us is two cases in individual, the women historically have been secreted, therefore it is necessary to disclose in individual towards them to avoid problems of sort equivalent to those of racism. Also she is worth the trouble to indicate that if science is not disclosed towards the takers of decisions it is difficult that these value their importance.

The Informal Education

Throughout our life we continued learning, this is known him like informal education. With respect to science the general public learns by means of the spreading. Therefore it is fundamental that there is a great diversity and quality in the matter of popularización of science.

In my opinion the UNAM could play a key role in the informal education of science at the national level. The reason is the following one: we lived immersed in a culture that favors the suffering and sacrifice. Let us think about the gifts that waited for the Mesoamericans Gods, where the greater gift was the same life, or the physical sacrifices that favor some modern religions. Another characteristic of some religions is that it is considered that the sacrifice is a virtue. Since this is the culture that we inherited is present in several scopes of our life,

including the formal education. Many professors feel like victims of the system and they become heroes, in some schools is going away to suffer, he is even gotten to think that if were difficult and laborious to learn it is good. That is to say, which instead of which the same process to learn the scholastic year throughout is reason for happiness, it is learned with pain and it feels fear by the examinations. This does not mean that it does not think that it is not necessary to make an effort to manage to learn, the one that something costs work to us takes to us to appreciate it, the one that something hurts to us paralyzes to us.

If we obtained that the informal education of science becomes an act of pleasing and that consequently is enjoyed the same process to learn and to understand products happiness we will have influenced positively in the national education.

How is due to disclose science?

Science is due to disclose using the greater number of means and possible systems with the best quality and an ample public, with the purpose of guaranteeing its intention: that the population counts on a scientific culture.

Some means par excellence are the average writings by their tradition and durability, the massive means including the calculation network, the factories and conferences that have the advantage of the interaction and the possibility of engaging in a dialog with the experts and the museums that reunites all the previous experiences plus others like theater, demonstrations and exhibitions.

The evaluation

It is necessary to create systems of evaluation for the spreading of science. We must know very clearly that it is what we try with our projects of popularización and to assure that the users manage to integrate science to their culture, according to its reality. The evaluation it must make the pairs that have ample recognition.

The National System of Investigators contemplates to the spreading how high-priority for the development of science in Mexico and already the first cases of popularizadores are being evaluated. It is important that the spreading work is professionalized consequently and that is approved the Masters in Spreading of the Science organized by organizations like the Main directorate of Spreading of Science.

He would be very desirable that in addition was a Prize National University to the Popularizatión.

Conclusion

We lived in a complex world, one of the maximum satisfactions is in the pleasure to understand. If through the spreading of science we obtained the population has satisfaction when acquiring its scientific culture we will have been successful. A great diversity is necessary to make spreading using of methods and levels to guarantee the best result.

The UNAM is not only responsible to create new knowledge, to protect it but also to spread it. The UNAM would benefit with a new Coordination dedicated to the spreading of Science, also with a masters in popularización and a Prize National University in scientific spreading.

Science is Interesting, Amused and Necessary

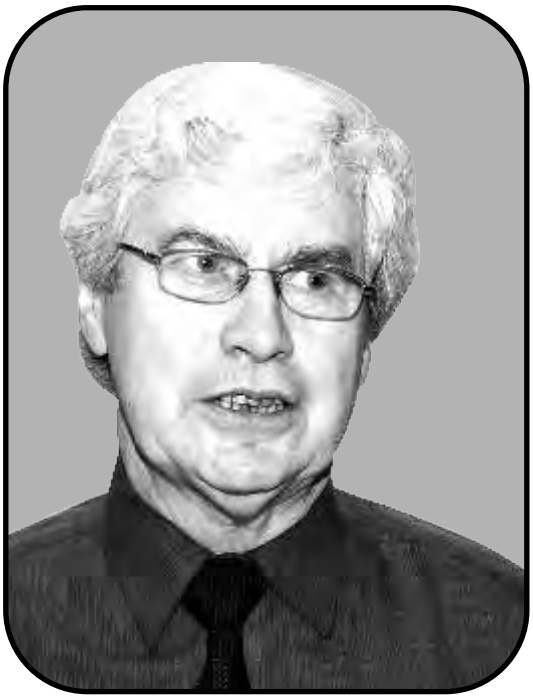
…Julieta Fierro Gossman

To Understand Science is a Pleasure.

…Julieta Fierro Gossman

Kalinga Laureate for Popularization of Science - 1996

Dr. Jiří Grygar, Czech Republic



[Born : 17th March, 1936, Heinersdorf, Germany, today Dziewietlice, Poland ...]

Natural sciences are surprisingly sucessful when they want to answer questions, saying the child and are starting to classical words "why" (why is it so ?). At that time, science is usually silent, or, if at all made a reply, so we never too does not.

...Jiří Grygar

Jiří Grygar : A Biographical Profile

Jiří Grygar (March 17, 1936 in Heinersdorf, Germany, now Dziewietlice, Poland) is a Czech astronomer and popularizer of sciencne.

After studying physics at the Masaryk University in Brno and astronomy at the Charles University in Prague he joined the Astronomical Institute of the Academy of Sciences, department of Stellar Astronomy in Ondrejov. Twenty years latter he moved to the Institute of Physics, Low Temperature Physics Department at Reo, where he remained for more than ten years. Shortly after the Velvet Revolution he joined the High Energy Physics Department at the same institution. From 1992 to 1998, Grygar chaired the Czech Astronomical Society. He also chaired the Czech Television Council and the Science and Philosophy section of the European Culture Club. He is member of editorial boards of the periodicals *Říše hvezd, Vesmír, Universum and Omega.*

Grygar holds a Ph.D. in astrophysics. His papers focus on interplanetary matter (meteors, comets), limb darkening in stellar atmospheres, close binaries, novae, chemically peculiar stars and remote sensing.

He is well known to the public in the Czech Republic and Slovakia because of his famous TV series about the Universe - *Okná vesmíru dokorán* ("Wide open windows of the Universe"; 1982 - 1990). He also engages in activities against un-scientific charlatanism (in the SISYFOS Club of Skeptics [1] (http://www.sisyfos.cz/sisyfos/infotext_eng.htm)).

Jiri Grygar (* 17 March 1936, Heinersdorf, Germany, Today Dziewie tlice, Poland), the English astronomer and astrophysicist. Is a major Czech popularizátorem science in the field of astronomy, astrophysics and the relationship between science and faith, for which received a number of awards, including awards from UNESCO (Kalinga 1996).

Scientific and Popularizing Activity

Jiri Grygar is the author of more than hundreds of professional work (the subject of his research are photometry and spectroscopy of stars, interplanetary matter and astrocásticová Astrophysics) and a wide range of popular educational books and educational programs. Also wrote manyarticles in newspapers or on the Internet, and often acts on the radio and television.

He is the Chairman of the Czech Learned Society, Vice-President European Council skeptical Organization (ECSO), honorary chairman of the Czech Astronomical Society, honorary board member of Czech Christian Academy (Section natural sciences and engineering), member of the Bohemian Club Skeptics Sisyphus and field captain graceful ride Ebicykl.

Since 1966 each year compiles a summary of the most important astronomical discoveries in the past year as the *harvest discoveries,* which presents lectures on and subsequently published by the press (first in the magazine Empire stars later Kozmos).

In the course of the International Astronomical Congress in Prague (2006) was editor - in chief congressional newspaper Dissertatio cum Nuncio Sidereo III. a similar post during the last Prague astronomical congress (1967).

It was named after the asteroid (3336) Grygar, discovered the 26th October 1971.

Creation

Television

- *Windows universe dokorán* (windows wide open space) (Bratislava series of studies Czechoslovak televison scenario : Vladimir Zelezny, director : Milan Vach, Anton Majercik, Juraj Lihosit)
- *Space laboratórium* (Kosice series of studies Slovak televion scenario : Francis Franko, Director : Jaroslav Kerner)
- *Golden century astronomy* (Czech television program, screenplay by Milan Pokorny, Director : Anton Majercik)
- 2008 - Message George Grygar, (http://209.85.171.104/translate_c ?

Books (selection)

- Space is our world (1973)
- In the depths of space (1975)
- Let's meet at infinity (1979)
- Space (1983) - the mountain and Z.P. Mayer
- Windows wide open space (1989) - with V. Iron ISBN 80-206-0126-0
- Big bang and the Bible (1991, 1997)
- Countries in the Universe (1992) - with L. Kalašova ISBN 80-00-00256-6
- Science, Faith, Space (1996)
- Space is the (1997) ISBN 80-204-0637-9
- The science and faith (2001) ISBN 978-80-7192-535-4
- Trialogue about life in the universe (2001 - the Ramesova P. and M. Grünem ISBN 80 - 7281 - 074-X
- Harvest disvoveries 2001 (2003) ISBN 80-903117-5-X
- Trialog the alien (2006) - the Ramesova S. and M. Green ISBN 80-7185-566-9

Source :

"http://cs.wikipedia.org/wiki/Ji%C5%99%C3%AD_Grygar"

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Curriculum Vitae of JiŠA [Jiri] Grygar

Born	:	March 17, 1936
Where	:	Prusko JindŠichov [Prusky Jindrichov] = Heinersdorf (Germany), now Dziewietlice (Poland)
Nationality	:	Czechoslovakian (now Czech)
Parents	:	Josef Grygar (customs officer),
		Hedvika Grygarov [Grygarova] born Stojanov [Stojanova] (teacher)
Present Address	:	JiŠA [Jiri] Grygar
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		CZ-182 21 Prague 8
		The Czech Republic
Phone	:	+420. 266 052 660
E-mail	:	grygar@fzu.cz

Studies	:	
1942-1951	:	Public Schools in Brno and Opava (Czechoslovakia)
1951-1954	:	Grammer school in Brno
1954-1957	:	Faculty of Science, Masaryk U., Brno
		Physics (B.Sc.)
1957-1959	:	Faculty of Mathematics and Physics, Charles U., Prague Astronomy (M.Sc.)
1959-1963	:	Astronomical Institute, Czechoslovak Academy of Sciences, Prague Astrophysics (Ph.D.)
Employment	:	
1963-1980	:	Dept. of Stellar Astronomy, Astronomical Institute, Czechoslovak Academy of Sciences, OndŠejov [Ondrejov] (Junior scientist; scientist; senior scientist)
1980-1991	:	Dept. of Low-Temperature Physics, Institute of Physics, Czechoslovak Academy of Sciences, oeo (Rez)
		(senior scientist)

1991-now : Dept. of High-Energy Physics, Institute of Physics, The Academy of Sciences of the Czech Republic, Prague (senior scientist)

Society Membership :

1959-now : Czechoslovak (since 1991 : Czech) Astronomical Society

(1959-1992 member of the Executive Committee; 1992-1998 President)

1967-now : International Astronomical Union

(member of Commissions Nos. 27 and 42)

1976-now : Czechoslovak (since 1991: Czech) Union of Mathematicians and Physicists

(1990-1993 Vice-Chairman of Physics Section; 1990-1996 member of the Central Committee)

1991-now : European Astronomical Society (Founding Member)

1994-now : The Learned Society of the Czech Republic

(Founding Member; 1998-2002 member of the Council; 2004-now President)

Other Positions:

1991-1993 : Grant Agency of the Czech Academy of Sciences, Scientific Council (Chairman)

1992-1997 : Council of the Czech Public Television (Chairman)

1992-2002 : European Culture Club, Prague

Division for Science and Philosophy (Chairman)

1993-now : Subsequently member of Scientific Councils of the Institute of Physics, Astronomical Institute, Czech Academy of Sciences, Masaryk U., Astronomical Institute of the Slovak Academy of Sciences

1995-now : Czech Club of Skeptics SISYFOS

(member of the Executive Committee)

2001-now : European Council of Skeptical Organisations (ECSO)

(vice-president)

Editorial Boards :

1961-1994	**:**	oA'e hvozd [Rise hvezd] (The Realm of Stars) - popular astronomy (1990-1992 Chairman)
1963-1990	**:**	Kosmicko [Kosmicke] rozhledy (Cosmic Review) - Czech Astron. Soc. (Chairman)
1990-2000	**:**	VesmAr [Vesmir] (The Universe) - popularization of Science

Stays abroad:

1963 and 1966	**:**	Astronomical Institute, University of Utrecht, Holland
1969-1970	**:**	Dominion Astrophysical Observatory, Victoria, B.C., Canda

Awards and Honors:

1984	**:**	Czechoslovak Television Award for the TV series: Windows of the Universe Open Wide (in Czech)
1989	**:**	Honorary Member of the Czech Astronomical Society
1992	**:**	Czechoslovak Government Medal "Comenius"
1994	**:**	Czech Academy of Sciences Award for Popularization of Science
1996	**:**	International Astronomical Union : Minor planet No. 3336 named "Grygar"
1996	**:**	UNESCO Prize Kalinga
1997	**:**	Foundation of Masaryk University Award
2002	**:**	Honorary Member of the Union of Czech Mathematicians and Physicists
2004	**:**	Honorary President of the Czech Astronomical Society

Research :

I have started my research by studying meteor showers and comets and my first papers in the subject were published in 1958 and the last in 1970. From 1960 I was involved in the studies of close binary stars and of stellar atmospheres. I published the first paper in this field in 1962 and remained active in this topic until now. My next interest was the the photometry and spectroscopy of bright novae (1968-1997). I was also involved in the problems of the remote sensing of the Earth (1981-1991). Since 1991 I am mainly doing research in the field of high-energy astrophysics. In 1999 I received a grant for the Czech

participation in the international Pierre Auger Observatory in Argentina that is being build by a consortium of 13 nations. The aim of the Observatory is the investigation of the ultra-high energy cosmic rays that represent a major puzzle of contemporary physics and astronomy.

Until now I published about 120 papers that were cited more than 650 times. The complete list of my papers could be found in the address: www.astro.cz/~grygar/puvodni./htm

Popularization of Science:

Since my student years I am also involved in the popularization of science. I delivered more than 3,000 public lectures in schools, culture clubs, public observatories in all Czechoslovakia. I published or co-published more than 30 popular books and CDs plus more than 1,000 articles and interviews. From 1966 I publish in Czech th annual reviews about the Highlights in Astronomy and Astrophysics that are together more than 2,000 pages long. Since 1959 I am a frequent speaker in the Czech Public Radio and since 1963 in the Czech Television.

Prague, January 2004 Jiri Grygaro

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Evolution of life on Earth naturally is a solid scientific theory, which provides a uniform interpretation of events that took place in the terrestrial biosphere since the emergence of life from atleast 3.8 billion years old.

...Jiří Grygar

The natural sense is not possible, nor proof positive of the existence of God or the negative evidence of its absence.

...Jiří Grygar

Kalinga Laureate for Popularization of Science – 1996

Prof. Jayant Vishnu Narlikar, India

[Born : 19th July, 1938, Kolhapur, Maharastra, India…]

I enjoy doing research in astronomy and astrophysics. My research supervisor Sir Fred Hoyle, who was himself a Kalinga Awardee, was a successful science communicator i.e. he was able to communicate what he was doing to the layman in a very simple and easy manner. I thought that he was an example that I should follow. I myself felt the urge that since I enjoy doing research why I don't I share my enjoyment with the layman.

...Jayant Vishnu Narlikar

Jayant Vishynu Narlikar
A Biographical Profile

Jayant Narlikar was born on July 19, 1938 in Kolhapur, Maharashtra and received his early education in the campus of Banaras Hindu University (BHU), where his father Vishnu Vasudeva Narlikar was Professor and Head of the Mathematics Department. His mother Sumati Narlikar was a Sanskrit scholar. After a brilliant career in school and college, Narlikar got his B.Sc. degree in 1957. He went to Cambridge for higher studies, becoming a Wrangler and Tyson Medallist in the Mathematical Tripos. He got his Cambridge degrees in mathematics: B.A. (1960), Ph.D (1963), M.A. (1964) and Sc.D (1976), but specialized in astronomy and astrophysics. He distinguished himself at Cambridge with the Smith's Prize in 1962 and the Adams Prize in 1967. He later stayed on at Cambridge till 1972, as Fellow of King's College (1963-72) and Founder Staff Member of the Institute of Theoretical Astronomy (1966-72). During this period he laid the foundation of his research work in cosmology and astrophysics in collaboration with his mentor Fred Hoyle.

Narlikar returned to India to join the Tata Institute of Fundamental Research (1972-1989) where under his charge the Theoretical Astrophysics Group acquired international standing. In 1988 he was invited by the University Grants Commission as Founder Director to set up the proposed Inter-University Centre for Astronomy and Astrophysics (IUCAA). Under his direction IUCAA has acquired a world-wide reputation as a center for excellence in teaching and research in astronomy and astrophysics. He retired from this position in 2003. He is now Emeritus Professor at IUCAA.

In 1966, Narlikar married Managala Rajwade, a Ph.D in mathematics. They have three daughters, Geeta, Girija and Leelavati, all of whom have opted for careers in science.

Narlikar is internationally known for his work in cosmology, in championing models alternative to the popularly believed big bang model. He was President of the Cosmology Commission of the International Astronomical Union from 1994 to 1997. His work has been on the frontiers of gravity and Mach's Principle, quantum cosmology and action at a distance physics. He has received several national and international awards and honorary doctorates. He is a Bhatnagar awardee, as well as recipient of the M.P. Birla award, the Prix Janssen of the French Astronomical Society and an Associate of the Royal Astronomical Society of London. He is Fellow of the three national science academies as well as of the Third World Academy of Sciences. Apart from his scientific research, Narlikar has been well known as a science communicator through his books, articles, and radio/TV programmes. For these efforts, he was honoured by the UNESCO in 1996 with the Kalinga Award.

Narlikar broke new grounds in space research, when during 1999-2003 he headed an international team in a pioneering experiment designed to sample air for microorganisms in the atmosphere at heights of up to 41 km. Biological studies of the samples collected led to the findings of live cells and bacteria, thus opening out the intriguing possibility that the Earth is being bombarded by microorganisms some of which might have seeded life itself here.

Narlikar was decorated Padmabhushan in 1965, at the young age of 26. In 2004 he was awarded Padmavibhushan.

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Biographical

Jayant Vishnu Narlikar was born in Kolhapur, in the state of Maharashtra, India on July 19, 1938. His father, Vishnu Vasudeva Narlikar was an eminent mathematician and general relativist. He was Professor and Head of the Department of Mathematics at the Banaras Hindu University, Varanasi. His mother Sumati Vishnu Narlikar (nee' Krishna Shankar Huzurbazar) was a Sanskrit scholar. Jayant grew up in an academic and scholarly environment at home with a liking for both mathematics and Sanskrit. He went to the University Children's School in the B.H.U. campus and invariably topped in all examinations including the matriculation one. He continued this tradition till the Bachelor of Science degree examination at B.H.U. in 1957.

After graduation he went to Cambridge University, U.K. for higher studies in mathematics. He joined the Fitzwilliam House, Cambridge in 1957 and obtained his Cambridge degrees B.A., in 1960, M.A., in 1964 and Ph.D. in 1963. While at Cambridge, he became Wrangler (in 1959) and achieved distinction at the Part III of the Mathematical Tripos along with the Tyson medal in astronomy in the following year. As a research student he was the W.A. Meak Research scholar of the University of Cambridge and won the coveted Smith's Prize in 1962. Later on he went on to win the prestigious Adams Prize at Cambridge in 1967. In 1976 he received the Sc.D degree of Cambridge University.

In 1966 Jayant Narlikar married Managala Sadashiv Rajwade who has a Ph.D in mathematics from Mumbai University. They have three daughters, Geeta, Girija and Leelavati.

Academic Career

Narlikar did his Ph.D. under the inspiring guidance of Fred Hoyle. In 1963, he went to King's College, Cambridge as Berry Ramsey Fellow (1963-69), later to become a Senior Re-search Fellow (1969-72). He also was the founder staff member of the Institute of Theoretical Astronomy which was established in Cambridge in 1966 by Fred Hoyle. He held this position till his return to India in 1972 to take up professorship at the Tata Institute of Fundamental Research, Mumbai. At the TIFR he was in charge of the Theoretical Astrophysics Group, which he developed into a strong center for astrophysics. He became Senior Professor in 1983, and upon leaving the TIFR in 1989, he held the position of an Honorary Professor there for three years.

In 1988 the University Grants Commission set up the Inte-University Center for Astronomy and Astrophysics (IUCAA) at Pune. At the invitation of the U.G.C. Chairman, Professor Yash Pal, Narlikar became the Founder-Director of IUCAA in 1988, first in an honorary capacity and then as a full-time director since 1989. Through his efforts, aided by many colleagues he has been able to bring to IUCAA international stature as a research center as well as a place for pedagogical activities.

Research Contributions

Narlikar has made important contributions to theoretical physics, astrophysics and cosmology. He is considered a leading expert and defender of the steady state cosmology against the more popular big bang cosmology. His work on conformal gravity theory with Fred Hoyle demonstrated how a synthesis could be achieved between Einstein's general theory of relativity and March's principle.

The scientific research of Jayant Narlikar has been in the areas of theoretical physics, astrophysics and cosmology. He had worked with Fred Hoyle in the early sixties in a mathematically rigorous description of matter creation in cosmology, which provided a sound theoretical framework to the steady state cosmology. Lately, in collaboration with Fred Hoyle and Geoffrey burbidge, he has been associated in the resurrection of the steady

state cosmology as the Quasi-Steady State Cosmology (QSSC). As a theoretical foundation, this cosmology uses the Hoyle-Narlikar theory of conformal gravity, which they had proposed in 1964. This gravity theory is wider in scope than general relativity, including as it does, a strong link with the Mach's Principle.

Hoyle and Narlikar have also worked together in providing a framework for the action at a distance electrodynamics (ADE). Starting their work on this programme in 1962, they have shown how ADE, as originally formulated by John Wheeler and Richard Feynman, can be described in a curved space time and how it can be given a quantum mechanical framework. Lately they have shown that with proper cosmological boundary conditions the ADE is free from the ultra-violet divergences that trouble the field theory of electrodynamics.

Narlikar was also responsible for providing astrophysical applications of a white hole. This idea was later to play to key role in theQSSC,by suggesting that the white holes, are the mini-creation centres where new matter appears in the universe. His extension of the Hoyle-Narlikar theory of conformal gravity has opened up the possibility of understanding the anomalous redshifts of extragalactic objects.

Narlikar has provided perhaps the only exact approach towards understanding how the big bang cosmology may be modified by quantum considerations during the Planck time scale. He has shown that by restricting to quantum conformal fluctuations, it is possible to avoid the spacetime singularity.

Honours and Awards

Jayant Narlikar has been honoured by several awards for his research, including the S.S. Bhatnagar award for physical sciences (1978), the F.I.E. Foundation's Rashtrabhushan award (1981), the B.M. Birla award (1993), etc. He is Fellow of the Indian National Science Academy, the Indian Academy of Sciences, the National Academy of Sciences of India, the Cambridge Philosophical Society, and the Third World Academy of Sciences. He has honorary doctorates from the Burdwan University and the Banaras Hindu University. He was decorated with Padmabhushan by the President of India in 1965.

Science Popularizaiton

Apart from his research work, Jayant Narlikar has established a name in the field of science popularization. He has used the print and electronic media for this purpose, with English, Hindi and Marathi as languages for communication. For his contributions to Science Popularization efforts, he has received the Indira Gandhi Award of the Indian National Science Academy (1990) and the Kalinga Award of UNESCO (1996).

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Science Popularization Efforts by Professor J.V. Narlikar

Professor J.V. Narlikar is a Theoretical Astrophysicist by profession, but has been contributing towards the popularization of science in many different ways over a long period. His first popular article was written in the early 60s in the magazine "Discovery" in the U.K. In this article he described the phenomena of gravitational collapse and the new discovery of quasars. This article was greatly appreciated by readers and other U.K. magazines; especially the "New Scientist" also carried out articles by him on topics relating to cosmology. While in the U.K. Professor Narlikar also developed into a public speaker and gave popular talks to undergraduate socities in the U.K.

In 1972 he returned to India to take up a position in the Tata Institute of Fundamental Research (TIFR). While at TIFR, he continued to write for popular science magazines as well as appearing in the radio and T.V. shows relating to science. The list of publications of his popular articles presently runs to over 400 and covers his contribution in English, Marathi (his mother tongue) and Hindi (the National Language of India). His T.V. shows also had these three languages and were considerably appreciated by the audience.

During 1980-81 Narlikar was associated with the screening of a serial in Marathi on the Bombay T.V. called "Akashashi jadale nate" (On developing relationship to the sky). This series covered different aspects of astronomy with the help of discussions and slides. It caught the public imagination and was very popular.

In the mid 80s Narlikar compered Carl Sagan's famous serial "The Cosmos" with a Hindi introduction in the beginning. This was greatly liked by the audience since the summary of the episode in Hindi conveyed to the audience the broad scope of what was to be presented. Taking a cue from the success of this serial, Narlikar proposed to the then Prime Minister Rajiv Gandhi that a serial in astronomy in Hindi should be screened on the Indian television. This suggestion was readily taken up and Narlikar was asked to devise the serial to be made by the Films Division of India. This serial in 17 parts was completed and shown in India on several occasions during 1994-95. In a simple language with the help of stories and anecdotes this serial called "Brahmand" (The Universe) describes the exciting discoveries in astronomy. Because of participation by schoolchildren, this serial has reached a large section of the younger population .

Professor Narlikar's efforts in science popularization had also extended to writing Popular Science books in Hindi, Marathi and English as well as his technical writings. These books have been translated in other Indian languages also. In addition, Narlikar has also written science fiction stories and novels in these three languages and they have generated considerable response from the Indian readership. In his science fiction writing, Narlikar has tried to depict the Indian environment and highlighted the ongoing interaction between society and science, besides projecting it into the future. His science fiction story "Dhoomaketu" (the Comet) has been made into a 2-hour film by the Children's Film Society of India.

Professor Narlikar has been in great demand as public speaker in different parts of India and ha been regularly lecturing to the lay audience not only in Maharashtra (the State where he lives), but also in other parts of the country. The audiences at his lecture are very large and in some cases they have reached and crossed four figures. He managed to convey the excitement of astronomy and the importance of the scientific outlook in his talks. The lack of scientific outlook in his opinion has been a

hurdle in the progress of the country towards a better and more enlightened way of living. He has been emphasizing this in his various talks almost with a missionary zeal and has found several ways and means of popularizing the scientific outlook and rational behaviour. As a novel experiment towards science dissemination, Narlikar has started the practice of asking the autograph hunting schoolchildren to send him postcard with some scientific question to which he would reply with his signature. This has generated a large number of postal questions and answers in science. A subset of this was published recently by the Marathi Vidnyan Parishan, a voluntary science dissemination organization, as a booklet called "Postcardatun vidnyan" (Science though postcard).

For his contributions for science popularization, Professor Narlikar was awarded the Indira Gandhi prize by the Indian National Science Academy in 1990 and Kalinga Prize by UNESCO in 1996.

In 1997, Narlikar has been appearing in the TV Cultural Magazine Programme "Surabhi" where he answers questions from viewers requiring scientific information for answers.

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INTERVIEW
A SCIENTIST AND AN INSTITUTION

Interview with Jayant V. Narlikar, Astrophysicist, who retired as IUCAA Director after completing 15 years.

COURTESY : IUCAA

Early this year, Professor Jayant Vishnu Narlikar, the best-known Indian astrophysicist, stepped down from the directorship of the Pune-based Inter-University Centre for Astronomy and Astrophysics (IUCAA), after heading it for 15 years. A remarkable institution that he conceived, founded and nurtured as a common research and resource center for university scientists from across the country, the IUCAA was his long-cherished dream. It was realized in 1988 as an institution under the University Grants Commission (UGC) thanks to the active support of eminent space scientist Professor Yash Pal, who was then the UGC Chairman.

Narlikar took over as the Director of IUCAA on his 50th birthday and stepped down a day before his 65th birthday, on July 18, 2003 (Update, Frontline, May 23, 2003). He single-mindedly devoted his efforts to the building up of this institution while consciously staying away from the general scientocracy and science administration of the country unlike many other well-known senior scientists. His successor to the post, Professor Naresh Dadhich, who has been his long-time associate both academically and administratively at the IUCAA, says: “It is a formidable task and enormous responsibility to steer and institute of the IUCAA’s proportion and reputation and more so to succeed a man like Jayant whom we all hold in great admiration and awe”. The success of the IUCAA has resulted in the establishment of other inter-university centres across the country.

Academically, Narlikar rose to fame with the famous Hoyle-Narlikar theory of the steady state universe, postulated in the 1960s in association with his mentor and guide, the late Sir Fred Hoyle. The theory, however, is no longer popular among the mainstream physicists as the idea of a steady state universe gave way to Big Bang cosmology in the wake of the discovery in 1965 of the 3-Kelvin cosmic microwave background radiation (CMBR). This microwave background radiation, which the universe seems to be awash with, is believed to be the relic radiation of the early hot universe resulting from the Big Bang, which has now cooled down to 3 K (or 3° above absolute zero when all motion ceases, which is – 273° Celsius). Filling the universe uniformly and isotropically, the CMBR seems to have the characteristics of “thermal”, or what physicists call “black body”, radiation, where the spectral shape of the radiation is dependent only on the temperature and is independent of the source. In the case of CMBR, the radiation spectrum has the shape characteristic of a 3 K black body radiation.

This black body nature of CMBR its homogeneity and isotropy was dramatically verified in 1992 by the all-sky map of the relic radiation prepared by the NASA spacecraft Cosmic Background Explorer (COBE), flown in 1989, which gave a tremendous boost to Big Bang cosmology. While the Standard Cosmological Model based on the Big Bang has now come to dominate mainstream discourses in physics almost to the point of dogma, Narlikar and associates have carried with them their conviction of the basic idea of a steady state universe and have sought to explain the 3K CMBR as resulting from the starlight in the universe that is scattered by inter-stellar metallic grains and attains thermal equilibrium. In the wake of the COBE results, a modified steady state scenario was put forward by Hoyle, Narlikar and Geoffrey Burbidge a decade ago, called Quasi-Steady State Cosmology (QSSC).

In February this year, the Wilkinson Microwave Anisotropy Probe (WMAP), launched in 2001 (Frontline, September 14, 2001) as a follow-up to COBE with an order of magnitude better resolution, returned data which the Big Bang theorists believe have conclusively ruled out all cosmological models except the standard model based on the Big Bang. Indeed, according to it, it is claimed that with WMAP data all cosmological parameters have been more or less determined with precision and only some details remain to be filled.

Narlikar and Co, on the other hand, claimed that QSSC gives a better fit to the WMAP data and have continued to question steadfastly the conventional paradigm to the point of calling the approach unscientific. This is not to say that except for Narlikar and his coworkers, there is universal and unreserved acceptance of the standard Big Bang cosmological model. There are other skeptics as well who see a whole lot of unresolved issues of physics in the standard Big Bang cosmological model.

As Richard Ellis of the California Institute of Technology (Caltech), United States, put it, “the reason why most astronomers believe in the Big Bang is that it is the simplest picture that is consistent with the data. But it is very important that there are people who are constantly pushing to be provocative to make us question in more detail whether this is the right picture or not”.

Echoing similar views, E.P.J. van den Heuvel of the University of Amsterdam says: “It is very important that you have people like Narlikar who are exploring the other possibilities. There is a lot that people do not basically understand. And it is now being told that with WMAP there are only a few details to be filled in and then we know everything. It is not like that. I do not believe that.”

“It looks like at this point of time that Big Bang cosmology is a reasonably consistent framework but there is so much of physics that we still don’t understand like the dark matter and dark energy. Unfortunately, people don’t discuss the underlying assumptions to the Big Bang model,” he adds.

Frontline’s science correspondent **R. Ramachandran** recently caught up with Narlikar, the physicist, the institution builder and the science populariser, for a wide-ranging interview that covered various issues, including his non-conformist position in astrophysics, the IUCAA experiment, science popularization, and his future plans. Excerpts:

Q: After three decades of astronomical career in India, is there a feeling of fulfillment and satisfaction ?

JVN : I have stepped down from the directorship of the IUCAA while my astronomical career will hopefully continue for some more years. Yes, I have a sense of fulfillment and satisfaction as far as the IUCAA is concerned. The responsibility entrusted to me by Yash Pal in 1988 has been discharged to the best of my ability.

Q : Have there been any regrets at all?

JVN : None, so far as the IUCAA is concerned. So far as cosmology is concerned, I greatly deplore the current trend of an almost religious belief in the so-called standard Big Bang cosmology. It is assumed by the believers that all essential matters about the universe are settled and only some superficial details are left to be sorted out. This point of view is known today as "Precision Cosmology". It is inconsistent with ground realities – even the measured value of the basic Hubble Constant (a measure of the rate of expansion of the universe) remains controversial – and is opposed to the spirit of science which asks for repeatable experiments to check a theory and not a series of speculations howsoever consistent they might be.

When I entered the field of cosmology as a research student in 1960, the subject was open and there were observational possibilities of checking theories. Today one relies on N-body simulations based on speculative initial conditions to assert what is the correct model of the universe. If I were a research student today, cosmology would not attract me.

Q: Would you care to dwell in some detail on your 'non-conformist' position?

JVN : Fred Hoyle believed that with so much brainpower devoted to the standard approach, if it were right it would have led to considerable progress. This has not happened and had not happened any time during my research career. So, like Fred, I felt that it would be intellectually more challenging to try out new avenues rather than be one of a flock (see the only photograph in the book A Different Approach to Cosmology by Hoyle, Burbidge and Narlikar and you get the idea).

Nevetheless, some of the "alternative or non-standard ideas" proposed by Fred and me in the 1960s are today being accepted (without recognition of course!), such as: (i) negative energy scalar fields (ii) black holes in galactic nuclei (iii) superclusters and voids (iv) oscillating universe which has no singularity…

Q: At this point of time, it is generally believed that all parameters in the standard Big Bang cosmology have been more or less determined and what remains is only some fine-tuning, especially after the recent WMAP data. What are your views?

JVN : Mentioned earlier that his position is unscientific and is not consistent with ground realities. There are no direct observations of inflation, of the last scattering surface, of dark energy or of dark matter particles, concepts that have been invoked to make the basic idea of Big Bang work. The physics dealing with the very early universe is not laboratory tested. With untested physics and no direct observations, how can you claim to have a precise and confirmed theory? All they have

is a series of epicycles that fit consistently one onto another. Using quasi-steady state cosmology and directly observable quantities, we (Hoyle, Burbidge, Narlikar and others) have shown that all measured results about the universe can be explained without the standard paradigm.

The first detailed, all-sky picture of the infant universe. The Wilkinson Microwave Anisotropy Probe (WMAP) image reveals 13 billion-year-old temperature fluctuations (shown as colour differences) that correspond to the seeds that grew to become the galaxies. Encoded in the patterns are the answers to many age-old questions, such as the age and geometry of the universe. The WMAP team has made the first detailed full-sky map of the oldest light in the universe. It is a "baby picture" of the universe. Colours indicate "warmer" (red) and "cooler" (blue) spots. The oval shape is a projection to display the whole sky, similar to the way the globe of the earth can be projected as an oval. The microwave light captured in this picture is from 380,000 years after the Big Bang, over 13 billion years ago: the equivalent of taking a picture of an 80-year-old person on the day of his/her birth.

Q: ***One of the key arguments advanced in favour of the hot Big Bang cosmology model, besides the fact of CMBR itself, is the relative abundance of light elements like hydrogen, helium and lithium. How about that?***

JVN : Primoridial nucleosynthesis is the other test of classical Big Bang cosmology. What is not realized is that the light nuclear abundances in this cosmology are explained by a specific value of the coefficient in the time-temperature relationship . There is no explanation as to why that coefficient should be the right one to arise in the model. That is, it is put in by hand.

I was shocked to hear the view that the discovery of one WIMP (Weakly Interacting Masive Particle, a postulated candidate for a dark matter particle) would validate the standard model. I may be old-fashioned, but to me this sounds like justifying hot Big Bang by finding one nucleus of deuterium. The theory predicts certain abundance: it follows that one needs to check that claim directly.

Q: **Recently you have also been involved in another topic of controversy, namely the recent finding of microbes in space in the research supported by the Indian Space Research Organisation (ISRO) and carried out in association with researchers from Cardiff and the Centre for Cellular and Molecular Biology (CCMB) in Hyderabad. This hypothesis goes back to your thesis supervisor and long-term research associate Sir Fred Hoyle. What is it exactly that has been found and what are its implications?**

JVN: We have found microbes (cells and bacteria) in samples of air collected at a height of 41 km above the atmosphere. Given the protocol followed in the experiment, it is very unlikely that these are terrestrial contamination. Those who argue that they are contamination should show how! In the absence of any convincing explanation of terrestrial origin, we feel that they may have been showered on the earth from above- from comets, meteors, meteorites, etc.

I find that the "geocentric" view still persists in biology, although Copernicus banished it from astronomy. The controversy starts

because scientists do not keep an open mind as to where the origin of life on earth was. Any suggestion that it came from outside the earth is taken as wrong prima facie.

Q: There were some differences of opinion with the CCMB on the conclusions drawn from the findings. How did that happen? Has there been a reconciliation?

JVN : The protocols used by those at Cardiff and Sheffield were different from those at the CCMB. Now there will be an attempt to "wash out" the CCMB probes, which might make material sticking to the probe walls available for analysis, as was done for the Cardiff/Sheffield samples.

Q: Moving away from academics, in your efforts at establishing the IUCAA you would have had very close brushes with the science administration in the country, in particular the UGC. What do you see as the key problems that contribute to the stifling of scientific research and education ?

JVN : How an agency responds depends largely on the attitude of the agency's head. Barring a relatively brief but trying interlude, my interaction with these agencies has been very positive. Basically what one needs to emphasise is that a successful scientific institution has autonomy and working conditions different from those in a government department. At times considerable useful energy is wasted in convincing the bureaucrats of this difference of perception and for them to get over their view that "Aisa government mein nahi hota" I feel that the Prime Minister should issue a series of enlightened guidelines on how autonomous scientific institutions are to be run. Only then will this attrition stop.

Q: Has the IUCAA turned out to be an institution that you had envisioned, and has it lived up to your expectations?

JVN : Broadly speaking, yes, I wish there was greater freedom given to university staff and students to use facilities like the IUCAA. Also, I would have liked greater interaction between IUCAA academics and the associates from universities. Having said this, I should pay compliments to my colleagues at the IUCAA for having participated handsomely in the multifaceted academic programme of the IUCAA directed at universities.

Q: Do you think the concept of inter-university centres should be replicated more and more and expanded to other disciplines besides physics itself?

Yes, very much so, but, as I said, with greater freedom for the university researchers to use such facilities.

Q: What pitfalls and shortcomings that the IUCAA encountered should be avoided while replicating the experiment?

JVN : One should contract out services to the maximum extent. In retrospect we should have avoided having staff cars and leased the transport as and when needed. The Director should delegate powers to his senior colleagues to the maximum extent possible. I found this very useful. Above all, insist on as much autonomy as you can while framing your rules and byelaws. We found this very useful.

Q: Do you think this to be the only viable way of reviving the research environment in universities? Or else, what other measures should be taken to rejuvenate research in the university system?

JVN : I strongly feel that autonomous research institutions of the various science departments should be drawn more into university teaching and allow some of their facilities for university use. Only this way can they hope to have a base amongst the student population from where their own young scientists will come.

Q: The Tata Institute of Fundamental Research (TIER) was recently accorded the status of a deemed university. Do you think this is a good move for autonomous research institutions? Indeed, what can be done given this status?

JVN : If this leads to the situation I said in my earlier reply, it is fine.

Q: Since you arrived on the Indian astronomical scene, there has been a visible increase in astronomy research activity. It has indeed spread to smaller institutions and universities. But how do you view the overall quality of research in the country today?

JVN : The overall quality has gone up and the fraction of international level research has gone up judging from the lists of publications. However, quantitatively, basic sciences as a whole are suffering from shortage of young human power. Astronomy is no exception.

Q: You have done a great deal of science popularization work both in English and in Indian language, a facet not so common among scientists of the country. Why do you think the majority of scientists in the country do not give importance to public outreach? In fact, they do not even involve themselves in producing good textbooks. Why is that so?

JVN : They argue(i) is a waste of their time or (ii) they do not have the time for it, given their teaching and research. It is a matter of attitude and time management. As an editor of an astronomy book series, I have two authors who have kept delaying the submission of their manuscript for want of time. During that period, I was able to complete two books.

Q: What are your immediate plans after retirement besides research which I am sure will continue to occupy a significant part of your time?

JVN : Science popularization, textbook writing travel…

Source :

Frontline : Volume 20- Issue 25, December 06-19, 2003,

India's National Magazine from the Publishers of THE HINDU

I like doing science writing in English and Marathi but I do it in Hindi also because I was taught Hindi in schools. I feel that typical layperson enjoys or appreciates what you are telling him if we do it in the mother tongue.

I would like to say that even if you are not a professional scientist, you can read and write a lot about literature and you can communicate that in the appropriate language. If you are a working scientist you should look upon it as your responsibility for the society which supports your research you must give back something to it. You can do it in one way by telling them what science is all about, what are its advantages and disadvantages, how one should treat different discoveries, technologies are used.

...Jayant Vishnu Narlikar

Kalinga Laureate for Popularization of Science -1997

Professor Dorairajan Balsubramanian, India

[Born: 28th August, 1939 ...]

"The protracted debate over nature (genetics) versus nurture (environment) in understanding human behaviour is no longer valid, the two go together,"

...D. Balasubramanian

Curriculum Vitae

Professor Dorairajan Balasubramanian, Ph.D.

Prof. D. Balasubramanian
Hyderabad Eye Research Foundation
L.V. Prasad Eye Institute
Road No. 2, Banjara Hills
Hyderabad, 500034
India

Tel : +91-4023543652
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E-mail : dbala@lvpei.org

Prof Balasubramanian is currently the Director of Research, Hyderbad Eye Research Foundation, Hyderbad, India. He has also been the Deputy Director and later Director at Centre for Cellular and Molecular Biology (CCMB), Hyderbad; Lecturer and Assistant Professor of Chemistry, at IIT Kanpur, India and Professor and Dean at University of Hyderbad, India. His professional expertise and specialisation lies in the field of Biophysical Chemistry, Ocular biochemistry & Protein structure. He has Published over 130 research papers in international professional journals and written over 200 popular science articles in Indian newpapers. He received his PhD in chemistry from Columbia University, USA. Prof. Balasubramanian is the receipient of several professional honors the most noteworthy of them being UNESCO Award for science popularization and Third World Academy of Sciences Award for Basic Medical Research. The Government of India conferred upon him the Padma Shri in 2002. The same year, he received the prestigious Chevalier de l'Ordre National du Merite from the President of France.

Current Position : Director of Research, L.V. Prasad Eye Institute, Banjara Hills, Hyderbad 500 034, India (since June 1998).
Phone : +91-40-2354 3652; Fax : 2354 8271; Email : dbala@lvpeye.stph.net; dbala@operamail.com

Earlier Positions :

- Director, Centre for Cellular & Molecular Biology (CCMB), Hyderabad 500 007, India (until June 1998).
- Professor and Dean, University of Hyderabad, Hyderabad 500046 (1977-1982);
- Lecturer, Assistant Professor, Indian Institute of Technology (IIT), Kanpur (1967-1977).

Academic Training :
- M.Sc. Chemistry, Birla College, Pilani, India, 1959
- Ph.D. Chemistry, Columbia University, New York, USA, 1965
- Postdoctoral Fellow: Univ. Minnesota Medical School, 1965-66.

Research Interests :
- Molecular and Cellular Approaches to Understand and Treat Diseases of the Eye.
- Published 145 research papers and 2 books.

Other Major Interest :
- Work in the area of Public Understanding of Science, through popular science newspaper columns, radio and TV programs.
- Published over 300 popular articles and 6 books.
- Working with governments and agencies on issues of science and technology;
- Chairman-Biotechnology Advisory Council, Govt of Andhra Pradesh .

Honours & Awards :
- **"Padma Shri":** National honour by the President of India, 2002
- **"Chevalier de l'Ordre National de Merite" :** National honour by the President of France, 2002.
- Fellow – American Association for the Advancement of Science
- Fellow – Third World Academy of Sciences
- Fellow – International Molecular Biology Network
- Fellow of all the three Indian Science Academies
- Awarded the Bhatnagar Prize in Chemical Science, India 1981
- Won the Ranbaxy, Goyal, Bhasin and FICCI Awards, India
- Awarded the Third World Academy of Science Award in Basic Medical Sciences, 1995 and the Khwarizmi Award of Iran in Basic Medical Sciences, 1996.
- Awarded the UNESCO Kalinga Prize for the Popularization of Science, 1997, Paris, France.
- Awarded both the Indian National Science Academy's Indira Gandhi Prize for Science Popularization, and the DST/NCSTC National Prize for Science Popularization 2002.

Personal Details :
- Date of Birth : August 28, 1939; Citizen of India.
- Married to Shakti (ETV Producer), two daughters : Katyayani (Research Analyst) and Akhila (Public Health Professional).

❑

Short Summary of the Research activities of Prof. D. Balasubramanian

Professor D. Balasubramanian trained as a biophysical chemist at the doctoral degree level, and worked during the period 1965-1980 in the area of the structure and function of proteins and polypeptides. His special expertise lay in the spectroscopic analysis of their stability in solution.

Studies on the biochemistry and photochemistry of cataract :

It was around 1984-85 that he turned his full attention to eye research-to the proteins of the eye, in particular the crystallins of the lens and their role in keeping the eye lens transparent. He showed how photochemical (direct and sensitized) damage to these proteins compromise lenticular transparency and lead to cataract. This involved isolating the 'pigments' that accumulate in the human lens with age and during cataract, characterizing their chemical structre and their pro-oxidant (or antioxidant) behaviour. The major finding of these studies is that continual oxidative stress imposed on the lens, causing covalent chemical changes in the constituent molecules of this slow-turn-over tissue, leading to cataract.

Oxidative etiology of cataract and attempts to delay its progression :

Based on this finding, he has been looking at the use of chronic intake of antioxidant and cytoprotective substances in the daily diet (or as supplements) and how they can act as cataracto-static agents. Since cataract is a major cause of blindness in the world (accounting for over 50% of the blindness burden), and is of epidemic proportions in the developing nations, he has focused attention on such substances that are part of the daily diet and / or traditional medical practice of these people, and assess their potential role as cataractostatic agents. Some of these are tea polyphenols, ginkgo biloba and withania somnifera extractsubstances that are accessible, available, affordable and culturally acceptable to these people. Remarkably, all these substances are effective antioxidants and cytoprotective compounds, which retard the progression of oxidative cataract in experimental animals.

Molecular genetic analysis of some inherited eye diseases :

During the last 6 years, Dr. Balasubramanian has joined a group of ophthalmic clinicians, and extended his research to genetics and cell biology of the ye, which has been of direct clinical application. His more recent research has extended to the molecular genetic analysis of inherited forms of blindness such as primary congenital glaucoma. Work by his group on over 400 families revealed as many as 15 mutations in the gene CYP1B1, the most prevalent being the mutation R368H. Genotype-phenotype correlation has been done, as also the study of the structural changes that occur in the mutated protein, thus offering a clue to possible functional change. This has allowed (a) help to the clinician to intervene early and offer surgical care to save the sight of the infant, and (b) genetic counselling to the parents and the family.

Successful use of stem cell techniques to restore vision in patients :

More recently, his group has vigorously pursued the field of adult stem cell biology as well. With the discovery of adult stem cells in the limbus, surrounding the cornea of the eye, they have isolated these stem cells, explant cultured them on human amniotic membrane to produce transparent, stitchable corneal epithelia. These have been successfully transplanted to over 200 needy patients who has lost their vision due to chemical or fire burns, and restored vision to these eyes in significant measure. Many of these patients have not needed any subsequent corneal grafts, while others have successfully accepted a subsequent donor corneal transplant, to regain 20/20 vision. This work is perhaps the largest successful human trial of adult stem cell therapy anywhere.

Dr. Balasubramanian taught at the Indian Institute of Technology, Kanpur, and the University of Hyderbad, during 1967-80, before joining the Centre for Cellular & Molecular Biology Hyderbad (a national centre of excellence in biology), which he was Director of until 1998. He took early retirement from there to start the research wing of the L.V. Prasad Eye Institute, Hyderbad, where he is involved full time in basic aspects of eye research.

He is currently a Visiting Professor at the University of New South Wales, Sydney, Australia, Senior Fellow at the University of Melbourne, Australia, and the Birla Institute of Technology & Science, Pilani, India.

Professor Balasubramanian has published 156 research papers in peer-reviewed journals, of which 53 are in the area of eye research. A list of these publications is attached. In addition, he has authored two textbooks (in chemistry and in biotechnology).

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Summary of Dr. D. Balsubramanian's involvement in Science Communication and towards the Public Understanding of Science

Advice to Government in Biotechnology :

Apart from his professional research activities, he has been the Chairman of the Biotechnology Advisory Committee of the State of Andhra Pradesh. In this capaicty, he has assisted the state government in evaluating biotech enterprises, setting up the Biotech Park, and initiating the Biotech Incubator Facility. He has represented the government in the annual international trade conferences called BIO, in the US.

Efforts towards the Public Understanding of Science :

Print Media :

He is also committed to popularization of science, and has been regularly writing a fortnightly popular science column in the national English language newspaper of India. "The Hindu", every alternate Thursday-a total of over 300 articles since 1990. Prior to 1990, he wrote for the newspapers Newstime and The Times of India.

Compilations of these articles have been published as 4 popular science books, entitled :

"Cats Have Nine Lives",

"Genes and Means",

"Comet Tuttle and Space Shuttle", and

"The Mother of All Genes".

Audiovisual Media :

In addition, he appears on telvision-both educational and science-based channels and shows such as UGCTV, Door Darshan (programmes such as Countrywide Classroom, New Horizons, and Turning Point), Discovery Channel, both on air and as advisor.

He is an honorary President of the Andhra Pradesh based People's Science Movement called Jana Vignana Vedika.

Science Academies :

International :

He is a Fellow of the American Association for the Advancement of Science (AAAS), Washington DC, USA, and a Fellow of the Third World Academy of Sciences (TWAS), Trieste, Italy. He is a Consultant to TWAS & has Published, on their behalf, two public interest documents, entitled;

"Safe Drinking Water", and

"Capacity Building in Science in the Developing World".

He also consults for UNESCO, Paris, France, and is a member of their Committee on Bioethics. On behalf of UNESCO, he produced the position paper "Science for the Development of the South". for discussion by the Heads of Governments at the 1999 World Science Conference, at Budapest, Hungary.

National :

He is an elected Fellow of all the three science academies of India, and also the Andhra Pradesh Akademi of Science. He has been a Council Member and Editor of Publicaitons of The Indian National Science Academy, and an editor of the Proc. Ind. Acad. Sci. (Chem. Sci.). He is currently the Vice President of the Indian Academy of Sciences.

On behalf of the Indian National Science Academy, he organised two cross disciplinary symposia, entitled: "The Indian Human Hertiage", and "the Deccan Heritage", each of which dealt with the scientific, health, language and literature, music, geographical & historical heritage of India and the Deccan. The proceedings of these two symposia have been edited by him and published as two monographs, entitled

"The Indian Human Heritage" and

"The Deccan Heritage".

He has been a member of the National Steering Committee for the International Science Olympiads, sponsored and organized by the Homi Bhabha Centre for Science Education of the Department of Atomic Energy, India.

Kalinga Laureate for Popularization of Science - 1998

Ms. Regina Paz L. Lopez, Philippines

I choose to do what is right even when no one sees me, even when no one tells me, even when nothing compels me.

…Regina Paz Lopez

Regina Paz Lopez

Managing Director, ABS-CBN Foundation, Inc.

Board Member, Southeast Asian Foundation for Children's Television

Trustee, Foundation for Philippine Environment

An Extra-ordinary Profile of an Extra-ordinary Woman

Ms. Regina Paz Lopez
Managing Director
ABS-CBN Foundation Inc.
Mother Ignacia Avenue
Quezon City, MM 1100
Philipines.
Tel : 632 924 4101 to 22
Fax : 632 921 4042
E-mail : foundation@abs-cbn.com

Ms. Regina Paz Lopez, a Master in Development Management from the Asian Institute of Management, is an exponent of television-assisted instruction. She spent 11 years carrying out humanitarian work in the African continent mainly in Kenya but also in Zambia and Ghana. Her work involved assisting in the establishment of orphanages and children's homes. She is producer of Bago Yan Ah!, a radio program which provides a valuable grassroots science and general interest information service. She played a major role in the establishment of the Philippine's first media-based hotline, Bantay Bata 163 or Child Watch 163, part of a nation wide campaign on child welfare and against child abuse. She is the producer of four popularly – watched educational television programmes – Sine'skwela, Hirayamanawari, Bayani and Math-Tinik in the country. She presently serves as President of the Southeast Asian Foundation for Children's Television which are aired in Filipinos nationwide and cover diverse subjects such as fibre optics, future sources of energy, effects of pollution on organisms, human responsibility to the environment, as well as information concerning states of physical disability and basic First Aid, the list of topics goes on.

Ms. Lopez has also made a contribution to the socio-political development of her country and has been instrumental in the establishment of various infrastructures and services benefiting the public she so well serves. Such programmes as the Communities-in Crisis programme utilizes the media to draw much needed resources to poorer provinces of her native Phillippines.

Source : VIGYAN PRASAR

http://www.vigyanprasar.com

Ms. Regina Lopez, the daughter of a businessman and industrialist Don Eugenio Lopez, Jr., is an alumnae, of Assumption Convent in Makati and Newton College of the Sacred Heart in Boston, USA, and has a Masters in Development Management from the Asian Institute of Management. She has spent 11 years of her life in Africa, mainly in Kenya, Zambia and Ghana, carrying out humanitarian work. She helped in the establishment of orphanages and children's homes.

When she returned to Manila, she joined ABS-CBN Foundation as Managing Director, emerging as an exponent of television-assisted instruction (TVAI), the modern approach to classroom teaching being propagated in public elementary schools in the Philippines. Some of the subjects covered in these programmes are fibre optics, future sources of energy, effects of pollution on organisms, and human responsibility to the environment.

She produce four popularly-watched educational television programs, Sine'skwela, Hirayamanawari, Bayani and Math-Tinik which are aired nationwide.

Ms Lopez established a novel resettlement area in Iba, Zambales, for families displaced by Mt. Pinatubo, She started the Bayan-Microfinance Program, which guarantees the poor access to financial services. She is also the producer of Bago 'Yan Ah!, radio programme which provides information services at the grassroots level. Programmes such as Communities in Crisis use the media to draw much needed resources to the poorer provinces of the Philippines.

Among her outstanding projects are the establishment of the country's first media-based hot—Bantay Bata 163 (Child Watch 163), now a byword in child welfare and in the campaign against child abuse. After two years in operation, Bantay Bala 163 has received 5,025 reports and has so far rescued 467 children. Among the many awards this programme has received are the 1997 United Nations. Award for Excellence in Public Relations, and the Anvil Award for Public Affairs Child Protection.

Lopez is also the brains behind a similar media-based hotline for the environment called Bantay Kalikasan, in which cases involving environmental abuse, neglect and exploitation may be reported and then referred to the appropriate government or non government agency. This programme envisions a better environment and a better quality of life Filipinos. Bantay Kalikasan has launched the nationwide *Clean Air Signature Campaign* as its initial project, roping in the support of young and old alike. Its action is to create pressure groups and demand legislation which would ensure the protection of the right to clean air.

❑

If you were to give anything back, it would ideally be the gift of education.

... Gina Lopez

Trees are just like children; it is not enough to plant them. You have to take care of them.

... Gina Lopez

Gina Lopez : In the Service of the Filipino and her activies for Popularization of Science

Gina Lopez initiated Bantay Bata 163, the country's first media-based hotline and rescue operations and spearheads Bantay Kalikasan, a project that address environmental issues. Ms. Lopez produces Educational Television (ETV), an education through Multi-Media which garnered a United Nations Recognition Award in the Golden World Awards for excellence in international public relations.

MANILA, JANUARY 14, 2006 (STAR) By Sam Echavez People Asia Magazine – There is nothing more inspiring and humbling than sitting before a woman who is responsible for more than 20,000 children rescued from physical and sexual abuse, the conservation of La Mesa Dam and the popularity of educational TV programs that have revolutionized the Filipino way of learning. Meeting Regina Paz "Gina" Lopez, ABS-CBN Foundation's managing director, is like finally finding out that philanthropy comes with a beautiful face, a happy disposition and a muse-like smile.

"I love the country. I think the people here are special and I am in a privileged position to help them. That's what's keeping me busy," Gina says matter-of-factly. It is not about obligating herself to reach out but naturally responding to the country's critical needs, especially when they are about children, education, poverty and the environment. Although the ABS-CBN Foundation has long been known as a giant money generator for calamity victims, it was Gina who spawned magnanimous changes and touched so many lives.

She went to Newton College of the Sacred Heart to take Liberal Arts but she didn't finish the course. She joined a religious organization and stayed in Africa for 20 years, where she experienced the hard-hitting and impoverished life first-hand. "I wouldn't have been exposed to that, if say, I stayed in Forbes Park all my life," she points out, underlining the fact that this made her extra-sensitive to the concerns of the poor.

But even as a student at the Assumption Convent, Gina was already into philanthropic deeds, which earned the full support of her parents. "They were very loving. There was a strong feeling of family. They virtually just let us be. I never felt either parent breathing down my neck." The late Eugenio Lopez Jr. sure didn't. From him, Gina learned the value of integrity and the importance of vision. "I'm proud of my father, " she says. "Being his daughter is an absolute plus."

And so Gina made the most out of her surname, her father's legacy and available resources to initiate the following life-changing projects: E-media, Bantay Bata 163, Bantay Kalikasan and Bayan Foundation.

Long before the recent proliferation of fantasy-themed television programs, there was Hirayamanawari, a television program that used fairies and other supernatural beings and situations to educate children about values and good conduct. It was Gina's brainchild, together with Sineskwela, Math-inik, Epol Apol and Bayani that made up E-media. Over the years, these programs have garnered numerous accolades from prestigious award-giving bodies, including the Asian TV Awards, the New York Festival and Prix Jeunesse International.

Gina solicited enough money to equip public schools with television sets and urged the Department of Education to oblige the teachers to allot a special time for program viewing. The programs disseminated information through creative and innovative means that benefited more than 14 million students.

"The Children's Village is my greatest achievement for Bantay Bata." She once said to President Gloria Macapagal-Arroyo," Just watch me. I will transform this into a paradise for children." And what a paradise it is. The Children's Village in Norzagaray, Bulacan has become more than a shelter and rehabilitation area for 140 children. It now stands as a model for excellence in childcare and concretizes all of Gina's dreams for the Filipino youth.

The La Mesa Resort and Ecological Park, on the other hand, is Gina's pride for Bantay Kalikasan. Located within the La Mesa Dam watershed, this is now a major environmental hub perfect for picnicking, fishing or simply gorging on nature's splendor.

Up next on Gina's agenda are the development of mangroves, mainstreaming nontraditional forms of wellness and the eradication of malnutrition in the Bicol area. "We can do it!" she exclaims. Her statement is punctuated with the conviction that made everything possible, including the instituting of the Bayan Foundation this year.

"Financials are always a key challenge. Oh, to dream is easy but the money to implement…" she relates regarding the foundations' initial setbacks. However, it doesn't stop her from suddenly getting excited as she lets PEOPLE Asia in on her plans to raise $30 million to target the 20 depressed areas in the country. "The need drives it," she simply answers when asked about how she comes up with her reforming ideas. For her, as long as the issues are relevant, everyone will follow suit and care the same way that she does. "Getting the right people was a major challenge, " she adds.

She's quick to credit all 600 of them. "It is important for me to say that there is no way I could have done this without my people. The people in the ABS-CBN Foundation are of exceptional caliber and I have much love for them. Without them going the extra mile, without them just being the kind of people they are, my dreams will remain just that – dreams. Actually their dreams and visions are now interspersed into what the Foundation is now."

Gina addresses the issue of apathy with a positive outlook. "It's a consciousness thing. There are different levels of being and one continues to evolve. The people who are apathetic will not be that way forever. Life is a constant state of evolution. The universe will always see to it that everyone grows." Such a declaration leads to the topic of how she advocates inner growth. "I truly feel that inner growth should be a key component of development. I don't mean in the religious sense : of going to mass, confession, etc. But feeling God within, integrating a space of reflection, silence in one's daily life. This has direct bearing on anything one does outside."

It shows as she lovingly mothers her two kids, Benjamin and Roberto, and as she skips the social jungle for meditations with the help of her mentor. Most of all, this commitment to inner growth is instrumental to the societal empowerment, environmental reforms and all her other charitable endeavors.

"I get a kick out of helping people," she beams. It is her passion, a mission fervently executed. But one can easily surmise that this big-hearted lady is not only helping people. She is changing the world.

Ms Lopez was cited as a Proponent of Science Popularization for producing Bago' Yan Ah!, a Radio Programme which Provides information services to the grassroots and four Popular Educational Television Programme – Sine' skwela, Hirayamanawari, Bayani & Math- Tinik in the Phillipines.

…Regina Paz Lopez

"It is Good to Dream & Dream Big".

…Bantay Bata 163 founder & ABS-CBN Bayan Foundation President Gina Lopez told young aspiring artists of the 34th Shell National Students Art Competition in her address during 2003 awarding vites.

…Regina Paz Lopez

Kalinga Laureate for Popularization of Science - 1998

Professor Ennio Candotti, Brazil

[Born : 1942, Rome, Italy ...]

To Temper Science & Arts is must.

...Ennio Candotti

In Brazil, the investments in Science are Peripheral : the research does not relieve fruits short-term, neither votes.

...Ennio Candotti

ENNIO CANDOTTI : CURRICULUM VITAE

Prof. Ennio Candotti

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Tel	:	(55-27) 335 28 40
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Prof., Ennio Candotti, is a physicist. He was born in Italy. After completing his studies in Italy he moved to Brazil and became a Brazilian national in 1983. Presently he is at the Department of Physics of the Universidede do Espirito Santo. He has been closely associated with the Brazilian Society for the Advancement of Science (SBPC). He served the Society as its Regional Secretary, Vice President and President.

With the mobilisation of the local scientific community he began activities towards the interpretation and diffusion of science to the public. A result of one such initiative was the launch of a series of more than 50 public conferences entitled Cincia as Seis a Meia or Science at 6.30 pm which spanned a period of 4 years.

In 1982 Professor Candotti was the key figure within a group of scientists initiationg the launch of the monthly science news magazine Cincia Hoje or Science Today, supported by the SBPC which brings information on scientific development of a quality that is acceptable to the scientific community but also accessible to the general public. This publication today remains a landmark in the popularisation of science in Brazil. During his long career Professor Candotti has published over 100 articles and research publications. Professor Candotti later launched a similar initiative in Argentina called Cincia Hoy.

Professor Candotti was the brain behind a series of books. Science Today at School dealing with various aspects of the natural sciences; a series of CD-ROMs and science information directed to children and a series of publication as technological developments called Technology Notebooks.

Personal Data

Name : Ennio Candotti

Name in bibliographic citations : Candotti, E.

Sex : Men

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Guava
29,060,900 - Vitoria, ES - Brazil
Phone : (27) 33352840 Fax : (27) 33352823

Education / Degree

1970-1972 : Expertise in Dynamical Systems.
Universita di napoli, UDSN, Italy.
Baskets of (a) : Instituto Nazionale Nuclear Physcics, INFN, Italy.

1968 - 1969 : Expertise in Mathematical Physics
Ludwig Maximilian university of Munich, LMU, Germany
Baskets of (a) ; Support for Research Foundation of the State of Sao Paulo, FAPESP, Brazil.

1966-1967 : Expertise in Relativity.
Universita degli Studi di Pisa, USP, Italy
Universita degli Studid di Pisa, USP, italy
Baskets of (a) : Support for Research Foundation of the State of Sao Paulo, FAPESP, Brazil.

1971-1972 : Graduate in Physics, Universita di Napoli, UDSN, Italy
Baskets of (a) : Instituto Nazionale Nuclear Physics, INFN, Italy

1960-1964 : Graduate in Physics. University of Sao Paulo, USP, Brazil.

Professional Performance

Federal University of Espirito Santo, UFES, Brazil

Institutional Membership

1995-Current : Link : Server procedure or celetista, Position : Assistant Professor, Work load : 40, Regime : Dedication Exclusive.

Activities

8/1995-Current : Education, Higher : Graduation.
Courses taught
Physics I
Physics II
Physics III
Physics IV
Structure of Matter
Evolution of Physics

4/2001-7/2001	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry.
		Activity in length held
		Prociencias CAPES / Vitoria.
4/2001-7/2001	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry
		Activity in length held
		Prociencias CAPES / Cachoeiro of Itapemirim.
4/2001-4/2001	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry.
		Activity in length held
		Physics for Poets (Exhibition) /Cachoeiro of Itapemirim.
10/2000-11/2000	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry.
		Activity in length held
		Leonarso Universal / Cachoerio of Itapemirim.
9/2000-10/2000	:	Extended university, Center of Exact Sciences, Department of Physics and Chemistry
		Activity in length held
		Leonardo Universal /Vitoria
9/2000-9/2000	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry
		Activity in length held
		Displays of Physics IV.
11/1999-11/1999	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry
		Activity in length held
		Displays of Physics III
2/1999-9/1999	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry.
		Activity in length held
		Prociencias CAPES / Cachoeiro of Itapemirim.
2/1999-6/1999	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry
		Activity in length held
		prociencias CAPES / Vitoria
9/1997-1/1998	:	Extended University, Center of Exact Sciences, Department of Physics and Chemistry
		Activity in length held
		Architecture Art and Science in the Renaissance.

9/1997-11/1997 : Extended University, Center of Exact Sciences, Department of Physics and Chemistry

Activity in length held

Architecture and Art in the Italian Renaissance.

8/1996-12/1996 : Extended University, Center of Exact Sciences, Department of Physics and Chemistry

Activity in length held

Prociencias CAPES.

Federal University of Rio de Janeiro, UFRJ, Brazil,

lInstitutional Membership

1974-19995 : Link : Server procedure of celetista, Position : Assistant Professor, Work load : 40, Regime : Dedication Exclusive.

lActivities

3/1974-7/1995 : Education, Higher : Graduation.

Courses taught

Physics - I

Physics II

Structure of Matter

Macanica Quantica

Elementary Particles

4/1975-12/1979 : Other technical and scientific activities, Institute of Physics, Department of Theoretical Physics.

Activity Performed

Coordinator basic cycle.

Instituto Nazionale Nuclear Physics, INFN, Italy.

Institutional Membership

1969 - 1972 : Link : researcher, Position : R 6, Regime : Dedication exclusive.

Foundation Institute for Theoretical Physics, IFT, Brazil.

Institutional Membership

1967 - 1971 : Link : Celetista formal, Position : assistant professor, Regime : Dedication exclusive.

Member of editorial board

1982-1997 : Regular : Science Today

1987 - Current : Regular : Ciencia Hoy (Buenos Aires)

Business Areas

1. *Large area :* Exact Sciences and Earth / Space : Physical / SubArea : General Physics / SPECIALTY : Physical classical and Quantum Physics, Mechanics and Fields.
2. *Large area :* Social Sciences / Area : Education / Sub Area : Public Outreach.
3. *Large area :* Social Sciences / Area : Sociology / SubArea : Politics of Science.
4. *Large area :* Social Sciences / Area : Education/ SubArea : Teaching-Learning/Specialty : Education in Sciences.
5. *Large area :* Social Sciences / Area : Sociology / SubArea : Sociology of Development / Expertise: Development and Environment ambent.
6. *Large area :* Social Sciences / Area: Living / SubArea: Epistemology.

Languages

Portuguese	**:**	Understands Well, Speak Well, Well Read, Write Well
Italian	**:**	Understands Well, Speak Well, Well Read, Write Well
Spanish	**:**	Understands Well, Speak Well, Well Read, Write Well
English	**:**	Somewhat understands, Speech Somewhat, Well Read, Write Somewhat
German	**:**	Somewhat understands, Speech Somewhat, Somewhat Say, Write Soon.
French	**:**	Understands Well, Somewhat Speech, Well Read, Write Somewhat.

Awards and Titles

2002	Doctor Honoris Causa, University of New Hampshire.
1999	President of Honor, the Brazilian Society for the Progress of Science.
1998	Kalinga-scientific, UNESCO.

Production in C, T & A

Literature

Complete articles published in journals

1. **Candotti, E. :** Coch, G. : Montemayor. R., thermal Gohost fields and unstable systems. Nuovo Cimento della societa Italiana di Physics B- General Physics, Bologna, v. 106B, p. 13-22, 1990
2. **Candotti, E. :** PALMIERI, C. : VITALE, B. . Noether's universal nature of infinitesimal transformations in Lorentz covariant field theories. Il Nuovo Cimento, Bologna, v. 7A, P. 271-279, 1972

3. **Candotti, E.** :PALMIERI, C. : VITALE, B.. On the inversion of Noether theorem in classical dinamical systems. American Journal of Physics, USA. v. 40.3, P. 424-427, 1972.

4. **Candotti, E. :** PALMIERI, C. : VITALE, B. . On the inversion of Noether Theorem in Lagrangian formalism. II Nuovo Cimento, Bologma, v. 70, p. 233-239. 1970.

Chapters of books

1. **Candotti, E. :** People in science education. In : Luisa Massarani : IIdeu Moreira de Castro, Fátima Brito. (Org). Science and the Public . Rio de Janeiro : UFRJ, 2002, v. , P. 15-23.

2. GUIMARAES, SP: **Candotti, E. .** Education and social movements in south Korea In : Samuel Pinheiro Guimaraes. (Org). Visions Brazilian Korea. Brasilia : IPRI, 2002,v. 1. p. 11-31.

3. **Candotti, E.** : Six memos for six issues. In : River Path Associates. (Org). Towards a democratic science (an e-conference for the British Council). London : The British Council, 2000, v. 1, p. 30-34.

4. **Candotti, E.** : Science in the city. In : Hector Ciapuscio and others. (Org). The city invites to think. Buenos Aires : Eudeba, 1999 v., p 35-43.

5. GUIMARAES, SP :**Candotti, E.,** Brazil Argentine scientific cooperation. In : Samuel Pinheiro Guimaraes. (Org). Prospects Brazil and Argentina, Brasilia : IPRI, 1999, v. 2, p. 221-238.

6. **Candotti, E.** : Presentation. In : SPBC : Vera M oak Rita Vera da Costa. (Org). Profiles of Brazilian Scientists. Sao Paulo : SBPC 1998, v., p V-IX

7. Carvalho, Vera maria : **Candotti, E..** Pinch of salt (presentation). In : SBPC. (Org). Scientists from Brazil, Sao paulo : SBPC 1998, v.I, P 5-7

8. **Candotti, E.** : Preface. In : Maria Lucia Maciel. (Org). The Italian Miracle. Rio de Janeiro : Relume Dumara, 1996, v. p. 9-15.

9. **Candotti, E.** : The monsters are children of the secret. In : Federal Council of Medicine. (Org). Ethics and Health Brasilia Federal council of Medicine, 1993, v.,P. 251-255

10. **Candotti, E.** : Preface. In : Washington Novaes. (Org). The Earth Water asks. Brasilia : SEMATEC, 1992, v., P. 5-8.

Texts of stories in news papers / magazines

1. **Candotti, E. :** Knowing the Amazon is imperative to defend it and develop it. Principios, Säo Paulo, p. 22-28, July 30, 2008

2. **Candotti, E. :** Decriminalize the search now. Journal of Science. Rio de Janeiro, p. 7-8, Aug. 24,2007

3. **Candotti, E.** : Amazon a national challenge. Science Amazonia, Belem. P. 2-2, 08 July, 2007

4. **Candotti, E**. : From the backwoods looking at the sea. O Povo, Fortaleza, P. 7-7, July 19. 2005

5. **Candotti, E**. : Mercosur's Science. Folha de Sao Paulo, Sao Paulo. P. A3, Dec. 16, 2004.

6. **Candotti, E.** : Surplus pro-Amazonia.Sheet I Sao Paulo, Sao Paulo, P. A3-A3, Sept. 13, 2004

7. **Candotti, E.** : Long live the SBPC Viva. Folha de Sao Paulo, Sao Paulo, P. A3-A3, 15 May 2003

8. **Candotti, E.** : Science and ethics. Iddeas and Debates, Goeldi Museum Paraense And Bethlehem, P. 1-25, Dec. 10, 2002

9. **Candotti, E.** : University of lives and dried. Journal of Science, 479, Rio de Janeiro. p. 6-7, April 12,2002

10. **Candotti, E.** : The Green Paper which was yellow. Journal of Science, Rio de Janeiro, v. 464, Agu. 17,2001.

11. **Candotti, E.** : The shirt of the Northeast. Journal of Science, Rio de Janeiro, 09 July. 1999.

12. **Candotti, E.** : The role of scientists in scientific kdissemination. Journal of Science, Rio de Janeiro, v. 408, April 16, 1999

13. **Candotti, E.** : The university off-axis, Journal of Science, Rio de Janeiro, 05 March. 1999.

14. **Candotti, E.** : Ciencia Hoy hare 10 years, Ciencia Hoy, Buenos Aires, v. 51, Jan. 01.1999

15. **Candotti, E.** : University and National Unity. Lornal of Science, Rio de Janeiro, v., 396, Aug, 28. 1998.

16. **Candotti, E.** : The vestibular of Einstein. The Gazette, Victoria, Dec. 26. 1997.

17. **Candotti, E.** : Four thousand could do science. The Gazette, Victoria, 05 September. 1997.

18. **Candotti, E**. : The University and the machines. The Gazette, Victoria, 05 September, 1997.

19. **Candotti, E.** : Without Holy Spirit. The Gazette, victoria, o6 June. 1997.

20. **Candotti, E.** : 2% for the Holy Spirit. The Gazette, Vitoria, June 12, 1996.

21. **Candotti, E.** : The a aces of the chimneys. The Gazette, Victoria, 19 May 1996.

22. **Candotti, E**. : Who is afraid of PM 10. The Gazette. Victoria, 09 may 1996.

23. **Candotti, E**. : The accounts of Mr. Dean. The Gazette, Vitoria, 31 out, 1995.

24. **Candotti, E**. : The patents and the scientists. Folha de Sao Paulo. Sao Paulo. 08 May 1995.

25. **Candotti, E.** : Decentralize the University. Jornal do Brasil, Rio de Janeiro. 06 September. 1994.

26. **Candotti, E.** : Challenge for S & T for the new government. O Estado de Sao Paulo. Sao Paulo, 08 May 1994.

27. **Candotti, E.** : The tolerance of abortion. Folha de Sao Paulo. Sao Paulo. April 28. 1994.

28. **Candotti, E.** : IBPC little Franco. Jornal do Brasil, Rio de Janeiro, September 28. 1993.

29. **Candotti, E.** : Careers in Science. O Globo, Rio de janeiro. 02 July. 1993.

30. **Candotti, E.** : Patent and thick bark. Folha de Sao Paulo, Sao Paulo, April 16. 1993.

31. **Candotti, E.** : Industrial Prpriedade in Congress. Journal of Science Today, Rio de janeiro, p. 4-5, March 26, 1993.

32. **Candotti, E**. : ECO 92 : First Evaluation of the Conference. Foreign Policy. Sao Paulo, Nov. 30. 1992.

33. **Candotti, E.** : SBPC and wet gunpowder. O Estado de Sao Paulo, Sao Paulo, Sept. 21. 1992.
34. **Candotti, E.** : Tragic science, Folha de Sao Paulo, Sao Paulo, July 12, 1992.
35. **Candotti, E.** : Biodiversity and Power. Folha de Sao Paulo, Sao Paulo, 09 July. 1992.
36. **Candotti, E.** : Charter of Human Rights and Tera. O Globo, Rio de janeiro. June 11. 1992.
37. **Candotti, E.** : Who pays the bill anyway ? O Globo. Rio de janeiro, 04 June. 1992.
38. **Candotti, E.** : Sect sect or not. O Estado de Sao Paulo. Sao Paulo, Feb 15. 1992.
39. **Candotti, E.** : Sovereighty, and national ianomamis issue. Fola of Sao Paulo, Sao Paulo, Jan. 14,1992.
40. **Candotti, E**. : The importance of being Severo. Folha de Sao Paulo, Sao Paulo, July 19. 1991.
41. **Candotti, E.** : Education Congress and the universities. Folha de Sao Paulo, Sao Paulo, Feb. 14. 1991.
42. **Candotti, E.** : Nucleraizacäo against the country Folha de Sao Paulo. Sao Paulo, July 29. 1990.
43. **Candotti, E.** : Parliamentary control. Journal of Science Today, Rio de Janeiro. v. 2009.
44. **Candotti, E.** : Jumping smoothly and without network. Folha de Sao Paulo, Sao Paulo.
45. **Candotti, E.** : The way the environment and purposes. Science and Environment. Santa Maria RGS.
46. **Candotti, E.** : Reflections of a Refracöes and ECO. Journal of the Institute of Advanced Studies at USP, Säo Paulo. v.15.
47. **Candotti, E.** : The disaster of the war of patents. Science Today, Rio de Janeiro, p. 45-49.
48. **Candotti, E.** : Patents of the Lord. The Globo 07/04/93, Rio de Janeiro.
49. **Candotti, E.** : The square of many citizens. Science Today, Rio de janeiro, v. 92.
50. **Candotti, E.** : Problems of alternatives. Journal of ANPOCS, Rio e janeiro. v. 23.
51. **Candotti, E.** : What We Brazil. Piracema, Rio de janeiro, v. 1.
52. **Candotti, E.** : Knowing the pre-history to preserve nature. Economy and Culture, Säo Paulo, v. 10.p. 52-55.
53. **Candotti, E.** : Aldrovandi, R.. JPVigier, Science Today, Rio de Janeiro.
54. **Candotti, E.** : The risks of course. Humana, Rio de Janeiro.
55. **Candotti, E.** : The public must understand the science. Official science, Rio de Janeiro.

Complete work published in annals of congress

1. Candotti, E. : Science and technology popularization and cultural diversity. In : International Conference for Science Communicators 2000, Pune. Proceedings of the first International Conference for Science Communicators, 2000. p. 64-68.

Production technique

Technical Work

1. Candotti, E. : Center for Science and Art of Cachoeiro of Itapemirim. 1997.

Other types of production technique

1. **Candotti, E. :** Methodology of research and technological innovation. 1996. (Course of short courses / expertise).
2. **Candotti, E. :** Methodolgy of research and technological innovation. 1996. (Course of short courses / expertise)

Other Works

1. **Candotti, E.** : Today's Science journal. 1990 (editor).
2. **Candotti, E.** : Ciencia Hoy. 1988 (editor).
3. **Candotti, E.** : Children's Science Today. 1986 (editor).
4. **Candotti, E.** : Science Today. 1982 (editor).

Bunkers

Participation in committees of judges stalls

Professor

1. Ubiratan D'Ambrosio : **Candotti, E.** : Interdisciplinary area. 2006. Federal University of ABC.

Other investments

1. Noronha Ana : **Candotti, E.** : European Festival of Sciences. 2007. Eropean Science Events Association.

Events

Participation in events

1. XXVII Brazilian Congress of Zoologia. Descriminalizar the research already. 2008. (Participation in events / congress)
2. Mercocities, science and technologia. As cities and sciences 2007. (Participation in events / congress).
3. IX Scientific Meeting of the Institute Butantan. Eppur you muove. 2007. (Participation in events / congress).
4. V Seminar of memory and sensitivity science and arte. Razäo, science and art. 2007. (Participation in events / Seminar).
5. 40 years Biota Amazönia. Biota II : Challenges tempered. 40 years later. 2006. (Participation in events / symposium).
6. Science Centers Congress. Science World Learning Centers and Museums the Place. 2005. (Participation in events / Congress).
7. 3rd International Union of Science Communication Conference. Sciencie communication - Country experiences. 2005. Participation in events / congress).

8. 9th Meeting of the Red Pop. Há art in the dissemination of science. 2005. (Participation in events / congress).
9. II International conference on interactions. Ciencia fundamental truth and politics. 2004. (Participation in events / Meeting).
10. Science and Technology and innovation for Defense and Defense Nacional. Ciencia, Scientists and military. 2003 (Participation in events/ Seminar).

Organization of events

1. SBPC : **Candotti, E.**, 59th Annual Rreuniäo of SBPC. 2007. (Congress).
2. Abeledo, C. : ARRUTI. C. : GATTONE, A., Ventura. Dora Fix : **Candotti, E.**, Science Technology and Society III. 2007 (Congress)
3. SBPC : **Candotti, E.**, 58th Annual Meeting. 2006. (Congress).
4. Ventura, Dora Fix : Abeledo. C. : GATTONE, A. : BALDI, A : **Candotti, E.**, Science Technology and Society II. 2006 (Congress)
5. Ventura, Dora Fix : **Candotti, E.**, Encuentro Regional Science Technology and Society. 2005. (Congress).
6. Ventura, Dora Fiz; GATTONE, A. : Abeledo. C. : BALDI, A. : **Candotti, E.**. Science Technology and Society. 2004 (Congress)
7. **Candotti, E.**, 5th Exhibition of Physics and Astronomy. 2001. (Exposure).
8. **Candotti, E.**, 4th Exhibition of Physics. 2000. (Exposure).
9. **Candotti, E.**, Shows 3rd of Physics. 1999 (Exposure).
10. SBPC; **Candotti, E.**, 45 the Annual Meeting of SBPC. 1993. (Congress).
11. SBPC: **Candotti, E.**, 44th Annual Meeting of SBPC. 1992. (Congress).

Other relevant Information

Coordinator of the project to research into symmetries and conservation laws of (Finep / Funtec) 1976/1980 Co-ordinator of the basic cycle of DF UFRJ in 1975-1979 Inst. Physics of the UFRJ taught : Basic physical, quantum mechanics, modern physics in the Department of Physics at UFES taught basic physical, Modern Physics, Evolution of Physics, Instrumentation for education, Intro. the study of physical phenomena, editor of Science Today Editor 1982-1997 State Science Hoy 1988-1989 President of SBPC 1989-1993 and 2003-2007 Baskets 1975-1977 CNPq 1988-1990 1A & 1 B Baskets 1765-1967 State Council FAPESP national Science and Technology 2003-2007 STC Coordinator of the commission for evaluation and budget for the 2004-2007 Member of the STC Foundation's Father Anchieta-TV culture 1989-1993 and 2003-2007 member of CONCITEC ES 2007-2008.

Kalinga Laureate for Popularization of Science - 1999

Professor Marian Ewurama Addy, Ghana

[Born : 7th February, 1942, Marian Cole ...]

Public Understanding of Science is crucial for development. If people do not understand science, they may not accept its product.

...Prof. Marian Addy

KALINGA PRIZE FOR THE POPULARIZATION OF SCIENCE
A Brief Profile of Prof. Marian Addy

The 1999 Kalinga Prize for the Popularization of Science was awarded *ex aequo* to Professors Marian Ewurama Addy from Ghana and Emil Gabrielian from Armenia at a ceremony organized in UNESCO's Paris Headquarters in November 1999.

Professor Marian Addy (born 1942) is Professor of Biochemistry at the University of Ghana, where she specializes in teaching and researching the clinical aspects of biochemistry. Among other research projects, she has led the departmental research group on medicinal plants and is currenly using the hepatic isozyme induced by pollutants as a means of monitoring pollution in the aquatic environment.

She is current or past President of a number of professional associations, including the Ghana Biochemical Society, Association of Women in Science and Technology and the Accra branch of the Ghana Science Association. In 1978-1979, as Director of Programmes for the Science Education Programme for Africa (SEPA), an African intergovernmental organization dedicated to the teaching of science to first and second cycle institutions, she was responsible for initiating programmes which included a two-year programme funded by USAID in science teacher education and non-formal education.

As part of her activities to popularize science, Professor Addy has been hosting a televised weekly National Science and Mathematics Quiz programme since 1994. The highly popular quiz show, in which secondary school teams from around the country compete, has the dual goal of motivating students to study science and helping the general public to accept and understand science. The questions are designed to be of relevance to people's daily lives. The programme is sponsored by industry. In recognition of her accomplishments in 'marketing' science to the public, the Chartered Institute of Marketing in Ghana nominated Professor Addy 'Marketing Woman of the Year' in 1995, a departure from the Institute's usual practice of rewarding accomplishments in marketing goods or services.

Professor Addy is conscious of being a role model for many young girls who know her either through her Quiz show appearances or through her numerous visits to science clubs in secondary schools and her participation in schools' non-formal scientific activities. It is her hope that through her actions she will have influenced at least some students to choose a career in the sciences.

Professor Addy is keen to launch a radio or television programme which would review traditional or superstitious beliefs about phenomena and explain these same phenomena in scientific terms. Biological phenomena such as infertility, birth defects and causes of common diseases could serve as a starting point. Subsequently, physical and mathematical phenomena (e.g. thunder and lightning) and the use of technologies in everyday life could be dealt with in the programme.

In a keynote address to the Ghana Academy of Arts and Sciences on 13 July 1999, Professor Addy explained her motivation. 'Public understanding of

science is crucial for development she said. 'If people do not understand science, they may not accept its products. The difficulty in getting people to accept genetically modified foods illustrates this. In our part of the world, public understanding of science is what is likely to help people rid themselves of beliefs which drive them to ascribe natural phenomena to mysticism and superstition. If we do not get rid of those beliefs, we will continue to fall backwards instead of moving forward. An activity that should be carried out in the near future is one that uses drama, or some other form of presentation that our people enjoy, to give people explanations for natural phenomena. If they do not get explanations, we cannot blame them if they continue to interpret these phenomena in terms of superstition and mysticism'.

Source :

http://text.unesco.org/tt/http://www.unesco.org/pao/Kalinga_Winners_1999.htm

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CURRICULUM VITAE

MARIAN EWURAMA ADDY
PROFESSOR OF BIOCHEMISTRY

Department of Biochemistry, University of Ghana,
P.O. Box LG 54, Legon. Ghana.

For contact ;
Telephone : 020 8135867 or 021511380

E-mail : costed@ghana.com; ewurama@ug.edu.gh

I. PERSONAL DATA :

1. Ghanaian
2. Female
3. Born Marian Cole, February 7, 1942
4. Married with two children

II. EDUCATION :

1. Ph.D. Biochemistry; Pennsylvania State University, University Park, Pennsylvania, U.S.A., March 1971.
2. M.S., Biochemistry; Pennsylvania State University, University Park, Pennsylvania, U.S.A., September 1968.
3. B.Sc., Botany (Special), Chemistry (Ancillary); graduated with First Class, University of Ghana, Legon. June 1966.

III. EMPLOYMENT :

University of Ghana :

1. Since October 2002; Part - time appointment as Professor of Biochemistry.
2. August 1997 - September 2002; Professor of Biochemistry. Full time appointment.
3. June 1992 - July 1997; Associate Professor of Biochemistry.
4. December 1982 - May 1992; Senior Lecturer, Biochemistry, University of Ghana.
5. 1982 - 1985; Head, Chemical Pathology Unit, Noguchi Memorial Institute for Medical Research.
6. 1977 - 1982; Lecturer, Department of Biochemistry.

Others :

1. October 1986 - August 1987; Visiting Professor, Atlantic Veterinary College (AVC), University of Prince Edward Island, Charlottetown, P.E.I. Canada.
2. 1978 - 1979; Director of Programmes, Science Education Programme for Africa (SEPA), an Inter-Governmental African Organization dedicated to the teaching of science to first and second cycle institutions.

3. 1972 - 1976; Assistant Professor of Biochemistry, College of Medicine, Howard University, Washington, D.C.
4. 1971 - 1972; Assistant Professor of Biology, Federal City College, (now University of the District of Columbia) Washington D.C.

IV. EXPERIENCES :

Teaching Experience

Taught Molecular Biology to Biology Majors at Federal City College, now University of the District of Columbia, Washington DC in 1971/72. Was a member of a team that developed a special curriculum to enable under-privileged students have a college degree in science.

Taught Biochemistry courses to pre-clinical medical and dental students, and to post-graduate students in the basic science departments at Howard University College of Medicine from 1972-1976.

Since 1977 I have been teaching various areas of Biochemistry, both basic and applied, to undergraduates and post-graduate students at the University of Ghana. Between 1977 1990 I taught pre-clinical Biochemisttry to the medical and dental students at the University's Medical School.

In 1991, I developed a post-graduate course entitled "Chemical Messengers", as an advanced course in biochemistry of hormones, other chemical messengers including neurotransmitters and signal transduction in general. In 1996 I developed and taught another post-graduate course entitled "Biochemical markers of Pollution" in response to interest in environmental monitoring and eco-toxicology.

For four years starting from 1997, I taught immunology to students in the School of Public Health as part of course on "Biological Basis of Public Health".

For three years starting from 1998, I was a member of a team that taught a Faculty-required course on *History and Philosophy of Science.* My area included bioethics.

Research Experience

Experience in research into the scientific basis for the therapeutic action of local medicinal plants, to corroborate the herbalists' claim of efficacy. The research involved setting up laboratory test systems to evaluate plants used by herbalists in the treatment of various diseases, especially diabetes, asthma and other inflammatory diseases. The research, portions of which wee carried out in research laboratories in Sweden, Canada, the United States and at home, included:

i. Establishing bioassays appropriate to the disease in order to evaluate efficacies;

ii. Using enzyme assays to establish mode of action and to ascertain possible toxicities of herbal preparations or fractions or compounds isolated from them;

iii. Using various separation techniques, especially chromatography, to fractionate and isolate bioactive fractions.

The research led to experience in the study of enzymes in the biosynthetic pathways of eicosanoids, especially the cyclooxygenase and monooxygenase pathways. An an outcome, various isozymes of cytochrome P450 have been studied including the renal isozyme used endogenously for arachidonic acid metabolism, as well as some of the inducible hepatic isozymes. Currently, I am using he hepatic isozyme induced by pollutants as a means of monitoring pollution in the aquatic environment.

Administrative /Organisational Experience

University : Head, Department of Biochemistry, University of Ghana, Legon: 1988-1991, 1993-1998. As Head I was responsible for scheduling of courses, overseeing teaching and research in the Department, proper conduct of examinations, annual reports, preparation of annual budget estimates and the general administration of the Department including welfare of all the staff.

As the first Head of the Chemical Pathology Unit of the Noguchi Memorial Institute for Medical Research, I was responsible for organizing the Unit into a functional unit by spearheading research in two main areas: (a) reference values for clinical laboratory data and (b) nutritional status of Ghanaian children.

Outside the University : My role as President of professional associations, has given me experience in organizing and mobilizing people. Chairmanship and membership of research and technical committees have afforded me the opportunity to help plan the activities of scientific research organizations.

As Director of Programs for the Science Education Program for Africa (SEPA) I was responsible for initiating the programs of the organization. I wrote proposals for funding, and actually ran workshops, conferences etc., to implement the funded programs. During my one-year stay I was able to obtain USAID funds for a 2-year program in various areas of science teacher education and non-formal education.

Others :

I have acted as External Assessor for NC State University, the University of Nigeria in Nsukka, University of Lagos in Nigeria, University of Sierra Leone and the University of Science and Technology in Kumasi, Ghana in their promotional exercises. I have refereed articles for the Ghana Journal of Science, Ghana Journal of Chemistry, Ghana Journal of Agricultural Science, Ghana Medical Journal and Discovery and Innovation, the journal for the African Academy of Sciences based in Nairobi, Kenya.

Consultancies

From February to March 1994 I was a member of a 4-man UNDP Consultancy Team in Ghana to formulate a National Action Program for Science and Technology Development.

From February to June 2001 I was a member of the Kwami Committee, a Technical Committee on Polytechnic Education in Ghana, set up by the National Council on Tertiary Education (NCTE), to study and make recommendations that would guide the NCTE to formulate policy and advise government on polytechnic education in Ghana.

From 2000 to 2005, I served as Executive Research Consultant for the Phytomedicine Division of PHYTO-RIKER, a pharmaceutical company interested in producing and marketing a line of thoroughly researched medicinal plant products.

I was a member of the Technical Committee, a component of the Project Team that put together the Ghana Human Development Report in 2000 in Science, Technology & Human Development, and in 2004 on *Breaking the HIV/AIDS Chain: A Human Development Challenge.*

International Experience

i) From August 1985 to July 1986, I was at the Biomedical Centre of Uppsala University in Sweden as a Fellow of the International Seminar in Chemistry. Here, using ileal smooth muscle contractions in response to electrical field stimulation and antigenic challenge, I evaluated *Desmodium adscendens* a plant used in Ghana for the management of asthma.

ii) Between 1986 and 1987, for a total of eleven months, I carried out research at the Atlantic Veterinary College (AVC) which had just been established at the University of Prince Edward Island, Canada. During this time, I evaluated the same anti-asthmatic plant, this time using lung tissue. My research resulted in publications, the first from the new College, which therefore awarded me a Certificate of Appreciation for "a significant contribution to the development of the Atlantic Veterinary College". The publications caught the eye of Merck, a pharmaceutical company, and resulted in my collaborating with Merck. The relationship led to the discovery of the *soyasaponins* from *D. adscendens* as agonists for opening calcium-dependent potassium channels.

iii) In 1988, I was one of two female scientists selected from Ghana to attend the Third World Academy of Sciences Conference on "The Role of Women in the Development of Science and Technology in the Third World" in Trieste, Italy and to make a presentation of my research work.

iv) In 1990, I was at the New York Medical College in Valhalla, New York, for six months. Here, I continued to evaluate the scientific basis of the effects of the anti asthmatic plant by studying its effect on eicosanoid biosynthesis via the cyclooxygenase and monooxygenase pathways of arachidonic acid metabolism.

v) From 1995 to 2000, as a contributing factor to the popularization of science, I gave lectures on Science and Tradition to some students from the US who came to the University under the College Semester Abroad Programme of the School for International Training.

vi) 1996-2002. I was a Foreign Faculty Mentor in an international research training programme for minority students first from 3 major universities in the Research Triangle area of North Carolina; Duke University, the University of North Carolina and North Carolina State University and then to students from Howard University, Washington DC. My involvement made the Department one of several foreign sites for student trainees from these universities. My role as a foreign mentor enabled students from these universities come to my laboratory during the summer for an experience in laboratory-based research on medicinal plants.

V. MEMBERSHIP ON BOARDS COMMITTEES AND OTHER ORGANIZATIONS.

International

1. Member, WHO Regional Expert Committee on Traditional Medicine.
2. Chair, Policy Committee on Developing Countries (PCDC) of the International Council for Science (ICSU).
3. Member of Executive Committee, International Network of Engineers and Scientists (INES).
4. Advisor, International Foundation for Science, Stockholm, Sweden.

5. First Executive Secretary of the newly established Western Africa Network of Natural Products Research Scientists (WANNPRES), established February 2002. www.wannpres.org

6. Regional Secretary for the Committee on Science and Technology for Developing Countries incorporating the International Biosciences Network (COSTED-IBN), for West and Central Africa, from September 1996 to December 2002. COSTED-IBN, now re-organized, was a subcommittee of the International Council for Science (ICSU).

7. Treasurer of the African Union of Pure and Applied Chemistry (AUPAC) 1995-1998.

National : Non-University

1. Chair, National Board for Professional and Technician Examinations (NABPTEX) since 2004.

2. 1998-2004, Member, National Council on Tertiary Education (NCTE).

3. 1996-1999, Member of the Ghana Atomic Energy Commission.

4. 1996-1999, Chair, Research and Technical Board of the Ghana Atomic Energy Commission.

5. Since 1996, Member of the National Advisory Board for Peace Corps Ghana.

6. Since 1994, Member of the Editorial Board of the Ghana Journal of Chemistry.

7. 1987-1989; CSIR Technical Committee on the Natural Sciences, as a representative of the discipline, Biochemistry.

8. 1980-1992; Research Committee of the Centre for Scientific Research into Plant Medicine (CSRPM).

9. 1982-1984; Council and Editorial Board of the Legon Society for National Affairs, Publishers of the Legaon Observer .

10. 1979-1982; Board of Directors, Ghana Oil (GOIL) Company Ltd.

National : University Committees and Boards

1. Academic Board Representative on the University Research and Conferences Committee. Represented the Board of the Faculty of Science on this Committee in the late 1980s.

2. Membership of the Academic Board, the Board of the Faculty of Science and the Medical School Board, by virtue of Headship of the Department.

3. 1996-1998, Member, Appointments and Promotions Board.

4. 1994-1996, Member of the Executive Committee, University of Ghana.

5. 1994-1996 and 1984-1985, Member of the University of Ghana Finance Committee.

6. 1994-1996, Chairman of Estate Management Committee, University of Ghana.

7. 1994-1999, Member of Management Committee of the Noguchi Memorial Institute for Medical Research.

8. 1988-1996, University of Ghana representative on National Commission on UNESCO, Natural Science Section.
9. 1982-1985; Management, Research and Appointment Committees of the Noguchi Memorial Institute for Medical Research.
10. 1982-1983; University of Ghana Counseling and Placement Advisory Board.
11. 1981-1984; Universities of Ghana representative on the National Environmental Protection Council.
12. 1980-1985; Honorary Coach, University of Ghana Amalgamated (Sporting) Clubs.
13. 1980-1984; University of Ghana Medical School Board, the Board of the Faculty of Science and the Residence Board.
14. 1979-1990; Tutor in Volta Hall, the female hall of residence.

VI. MEMBERSHIP OF ASSOCIATIONS :

1. Fellow, Ghana Academy of Arts and Sciences. Elected in 1999. Currently serving as Honorary Treasurer, elected in 2003.
2. New York Academy of Sciences, 1997-2004.
3. American Association for Clinical Chemistry, 1995-2004.
4. African Association of Pure and Applied Chemistry; Treasurer, 1995-1998.
5. Third World Organization for Women in Science.
6. Association of Women in Science and Technology (WIST) in Ghana, founding member and President.
7. Ghana Science Association. (National Vice President and President of the Accra Branch, 1978-1980).
8. Anglican Society at Legon, President, 1989-1993.

VII. INTERESTS AND HOBBIES :

1. Traditional (Indigenous) Knowledge Systems.
2. Capacity building in science, especially with females, both in an out of the formal school system.
3. Resource person and role model for programmes related to females, science and education.
4. Preparing and delivering public lectures to all categories of people in an effort to help with public understanding of science.
5. 1994-2000 Hostees of National Science and Mathematics Quiz Programme, a national weekly televised science quiz programme organized for secondary schools science to help and encourage students to study and keep to science, and to help the general public to understand and accept science

VIII. AWARDS:

1. Millennium Excellence Award, for Educational Development, December 30th, 1999. The nation's award to individuals who have excelled in their fields of endeavour at the turn of the millennium
2. **UNESCO Kalinga Prize for the Popularization of Science, 1999 recipient.**
3. National Award by the Enterprise Insurance Company Limited on the occasion of their 75th Anniversary (1999), for "invaluable contribution to educating Ghana's children and for creating enthusiasm in Mathematics and the Sciences"
4. 1998; Africa-America Institute (AAI)'s Distinguished Alumna for Excellence.
5. 1995, Marketing Woman of the Year, for marketing science. Awarded by the Chartered Institute of Marketing, Ghana, primarily in recognition of the success in hosting the National Science and Math Quiz Programme
6. 1990- Fulbright African Senior Scientist Award.
7. 1985-1986 - Fellow of the International Seminar in Chemistry, at Uppsala University, Uppsala Sweden. A ten-month fellowship offered by SAREC.
8. 1966-1971- Fellow, African Graduate Fellowship Program (AFGRAD) of the African-American Institute, towards M.S. and Ph.D. study programs.
9. 1962-1963- Winner of the "California Prize", awarded by the Chemistry Department, University of Ghana, to the best freshman in Chemistry.
10. 1962-1966- During undergraduate years. Winner of the "Waddell Prize" awarded to the best science student.
11. 1963- Winner of the "McCallien Prize" awarded to the best student in Volta Hall, the female hall of residence.
12. 1962-One of the winners of "Shell Prize", awarded by the Shell Company, Ghana Ltd., to the top six (6) candidates who passed the General Certifiate of Examinations, "A" Level.

IX. POPULARIZATION OF SCIENCE :

1. "Science in Africa and Wealth Creation". Delivered as Keynote Address at the Opening Ceremony of the 7th Symposium on Science and Technology organized by the Research Council of Zimbabwe. September 2004.
2. "Innovation within Tradition: A Development Imperative. Paper presented at a 3-day symposium on The Contemporary Relevance of Tradition. Organized by the Ghana Academy of Arts & Sciences in collaboration with Goethe Institut. September 2004.
3. Research and Collaboration with Traditional Medical Practitioners: Code of Conduct. A paper presented at the 2nd African Traditional Medicine Day and 4th Traditional Medicine Week in Ghana. August 2004.
4. "On traditional medicine and medicinal plants", presented at a seminar on "Linking traditional

and scientific knowledge for sustainable development" during the World Summit on Sustainable Development, Ubuntu Village, Johannesburg. August 2002.

5. "Science Communicators' Function in a Era of Science for Peace. Delivered as the Keynote Address at the International Conference for Science Communicators, ICSS 2000, Pune University, Pune, India. January, 2000.

6. "Science and Technology for Development : The Past, Present and Future". Delivered as the Keynote address at the Ghana Academy of Arts and Sciences Inaugural event for its scientific activities towards the year 2000. July, 1999.

7. "Environmental Pollution Can Cause Infertility and More". Delivered at the Ghana International School monthly seminars. March 1996.

8. "Case Study: Women in Science and Technology (WIST)". Presented at the Workshop on PROFESSIONAL SOCIETIES IN AFRICA: Prospects for Development, organized by African Training for Leadership and Advanced Skills (ATLAS). Nairobi, Kenya. October, 1995.

9. "Improving Scientific Awareness in Society". Delivered at a symposium organized by the Ghana Academy of Arts and Sciences, Accra. April 1995.

10. "Traditional Practices and Science: Conflict and Harmony". Delivered at a symposium on the theme *Science and Society; The African Experience,* at the SOS- Herman Gmeiner International College, Tema. February, 1995.

11. "My blood glucose is higher or lower than normal, so what?". An inter-faculty lecture delivered at the University of Ghana, Legon. February 1995.

12. "Biotechnology out of Africa?" Delivered as the Keynote Address at the Symposium and Workshop on Genetic Engineering for Development, organized by the Foundation for African Development through International Biotechnology (FADIB), Enugu, Nigeria. September 1994.

13. "Culture Characterization by Molecular Techniques, Capacity and Capabilities in the Biochemistry Department". Delivered at the Conference on Food Biotechnology, organized by the Food Research Institute of the CSIR July 1994.

14. "Scientists are made, not born". A special lecture delivered upon request to an audience at the University of Cape Coast. July 1993.

15. "Women, Science and Technology". Presented at the Gender Analysis Workshop organized by the Development and Women's Studies (DAWS) Program of the Institute of African Studies, University of Ghana, Legon. July, 1992.

16. "Non-traditional role of the female". Presented during the African American History Month, at the W.E.B. Dubo is Centre, Accra. Ghana. February 1992.

17. "The Language of Science". Proceedings of the Ghana English Studies Association Conference, September 1991. pp 1-4.

18. "Vital Organs: Organs you may not play or play with." An Inter-Faculty Lecture given at the University of Ghana, Legon. January, 1991.

19. "Cholesterol". An Occasional Lecture given at the Univesity of Ghana, Legon. August, 1989.

20. "Alcohol and Alcoholism", a public lecture, delivered at the British Council Hall in Accra, under the sponsorship of the Ghana Science Association (Accra Branch). June 1988.

21. "Food intake and the nutritional status of the women and children of Gomoa Fetteh" in "Towards Food Self-Sufficiency in West Africa", edited by Kwodzo Ewusie, Proceedings of an international conference organized by the Institute of Social, Statistical and Economic Research, (ISSER), University of Ghana. Chapter 17: p 303-308. 1984.

22. "SEPA's Out-of-School Youth Program". Presented at a UNESCO Regional Workshop on Out-of-School Scientific Activities and the Popularization of Science and Technology. Dakar, Senegal. 1980.

23. "What kind of education for the pre-school child in Africa?" BREDA Seminar on the needs of the African child, and the adaptation of pre-school education to his cultural, economic and social environment. Dakar, Senegal. 1979.

Science is built of facts the way a house is built of bricks; but an accumulation of facts is no more science than a Pile of bricks is a house.

...Henri Poincare / Marian Addy

Scientists are made, not born.

...Marian Addy

Kalinga Laureate for Popularization of Science - 1999

Professor Emil Gabrielian, Armenia

[Born : 1st January, 1931, Ashtarak, Armenia
Died : 22nd July, 2010]

Prof. Emil Gabrielian
A Brief Profile

Prof. Emil S. Gabrielyan Vice-President & Academician - Secretary National Academy of Sciences of Republic of Armenia Marshal Bagramyan Avenue.24 and Moscowian St.15 375019 Yerevan ARMENIA Fax: 3741542406/ 585335 E-mail: gabri@sci.am	Prof. Emil S. Gabrielyan , Director Armenia Scientific Center of Drugs and Medical Technology Expertise (Closed Joint - Stock Company) 375001, Yerevan, Moskovyan St. 15 Ph. - (37410) 584020 / 584120 Fax : (37410) 542406 E-mail : admin@pharm.am URL : http://www.pharm.am http://www.spyur.am/pharmag.htm

A physician specializing in pharmacology, **Professor Gabrielian** (born 1931) is a former Rector of Yerevan Medical Institute (1971-1975) and former Minister of Health (1975-1989). During his time as Minister, he developed a more egalitarian form of healthcare for the population, including the day of open doors, one day in each week when the general public was able to consult leading medical specialists. He also distinguished himself for his efforts to mitigate the trauma endured by the Armenian population after the 1988 earthquake, including the setting up of a transnational system of telemedicine with the support of NASA to treat earthquake victims. 'During the devastating earthquake' wrote USSR Minister of Health E. Chazov in 1990 in the journal *Vrach,* 'E. Gabrielian greatly contributed to the organization of adequate healthcare of wounded persons at the highest level of modern medicine. The Armenian nation should not forget his contribution to saving thousands of lives.' Professor Gabrielian's own personal experience of the earthquake is summarized in his book, *Collaps* (1993), which also contains valuable data on the emotional stress suffered by the population and on the provision of medical and humanitarian aid.

A second book familiar to the general public is *To be or not to be* (1987). Published in Armenian and Russian, the book reflects Professor Gabrielian's attachment to preventive medicine. *To be or not to be* popularizes scientific knowledge of the effects of tobacco, alcohol and narcotics. Five years after the book's publication, Professor Gabrielian was named Director-General of the Drug and Medical Technology Agency and Head of the Research Laboratory of Pharmacology of Blood Circulation. He is today also President of the Pharmacological Association of Armenia.

A prolific writer, with some 300 scientific articles, 100 popular articles and several books to his name, Professor Gabrielian serves on the editorial boards of a number of national and international journals. He is Editor-in-Chief of *Physcopharmacology,* to name but one, and is a strong advocate of the popularization of history and use of folk medicine. It was Professor Gabrielian who masterminded the biography of the ancient Armenian physician, Amirdovlat Amassiaci. He is also the author of a biography of the Russian scientist I.M. Sechenov (1957).

In recognition of his contribution to the development of Armenian science and medicine, and of his efforts to ensure that all Armenians benefit from advances in medicine, Professor Gabrielian has been elected to the National Academy of Sciences (1994) and appointed to the Board of the National Foundation of Science and Advanced Technologies of Armenia, among other distinctions. Professor Gabrielian may be contacted at : gabri@sci.am; egabri@pharm. am.

Source : http://text.unesco.org/tt/http://www.unesco.org/pao/kalinga_winners_1999.htm

SHORT CURRICULUM VITAE
Emil S. Gabrielyan

PERSONAL DATA

Full Name	:	**Emil S. Gabrielyan**
Place of birth	:	Ashtarak, Armenia
Birthdate	:	1.1.1931
Research areas	:	Pharmacology and Physiology of Blood Circulation, Phytopharmacology, Pharmacology Blood Cells and ect. Member of the International Academy of Sciences; International Informatization Academy; Fellow of the Scientific Council of the International College of Angiology; Member of the Research Board of Advisors of ABI; Member of Russian Academy of the Natural Sciences; Member of Russian Medical-Technical Academy; Member of the New York Academy of Sciences; Member of the "Ararat" International Academy; Chairman of the Presidental Award Commission of Armenia, in Health Care and Medicine.
Current Position	:	The Vice-President of NASRA, Director of Drug and Medical Technology Agency of Ministry of Health of RA
Specialization	:	Pharmacology.
Address	:	Presidium of NASRA, 24, Marshal Baghramyan Ave., Yerevan 375019, Republic of Armenia
Phone	:	(+3741) 524780
Fax	:	(+3741) 569281
E-mail	:	gabri@sci.am

Short Curriculum Vitae

His Excellency, Chevalier,

Prof.Emil S. Gabrielyan *KH, MD, DSci, NYA, IAS, IIA, FICA, AISA, MOIF,DDG, LFABI*

Date of Birth : 31 January 1931

Place of Birth : Armenia

Profession : Physician - Pharmacologist

Education : Yerevan Medical Institute (1948-1954)

Research Grants

15 October 1960-25 April 1961

- Research Institute of Pharmacology of the Medical Sciences of USSR (Moscow)

10 September 1964-15 March 1965

5 April 1967-5 July 1967

- Research Institute of Evolution Physiology and Biochemistry after named I.M. Sechenov (St. Petersburg)

WHO-Fellowship

12 September 1968-12 March 1969

- Wellcome Surgical Research Laboratories University of Glasgow (GB)

12 March 1969-26 March 1969

- The Nobel Institute for Neurophysiology, Karolinska Institute (Stockholm) and Laboratory of Clinical Neurophysiology, University Hospital, Lund (Sweden)

Visiting Professor Invited by the British Council

- 15 September - 29 September 1976

Professional Experience :

- Head Doctor and Surgeon of Arthik (Armenia) district Hospital (1954-1959)
- Assistant-professor at the Chair of Pharmacology of Yerevan Medical Institute (1959-1968);
- Docent of Pharmacology (1968-1971)
- Professor of Pharmacology (1988-1994)
- Head of the Chair of Pharmacology of Medical Institute (1988-1994):
- Professor of Pharmacology at the Chair of Pharmacology from 1994 at the present.

Administrative Activity

- Pro-rector of the Yerevan's Medical Institute (1969-1971):
- Rector of the Yerevan's Medical Institute (1971-1975)
- Minister of Health of Armenia (1975-1989)
- Director of Drug and Medical Technology Agency (from 1992- at the present)
- Vice President of the National Academy of Sciences of Armenia and Academician Secretary of the Division of natural Sciences of NAS (from 1994- at the Present)
- Head of the Research Laboratory of Pharmacology of Blood Circulation (from 1972- at the present)
- Chairman of the Administrative Board of the St. Great Nurses Medical Center of Saint Echmiadzin Cathedral Church (2002)

Scientific Degrees and Titles

- Candidate of Medical Sciences (1963)
- Doctor of Medical Sciences (1971)
- Docent (1968)
- Professor (1972)
- Academician (1994)

Honors and Awards

- Order of Labor's Red Flag 1980
- Order of Friendship of Nations 1985
- Medal of Health Excellency (Ministry of Health of USSR)
- Knight of Humanity (1992)
- "Merit for Life" - Order of The World Confederation of Chivalry.
- "Knight Cross"
- Pirogov's Medal of Soviet Red Cross (Founder of Russian Surgery)
- Sechenov's Medal (Founder of Russian Physiology)
- Kravkow's Medal (Founder of Russian Pharmacology)
- Medal of the Medical Academy of Krakow (Poland)
- Medal of the Academy of Medical Sciences of USSR
- Diploma of the Presidium of the Scientific - Technical Society of USSR
- Diploma of the Coordination Center of East European Countreies
- Honorary Diploma of the National Academy of Sciences of Armenia
- Diploma of the State Committee of Education of USSR
- "Man of the Year - 1996" American Biographical Institute (ABI)
- "Gold Record for Achievement in 1996" ABI
- "Key for Success in Research" ABI
- The Order of International Fellowship 1996 International Biographical Centre, Cambridge (IBC)
- International Man of the Year 1996/97 (IBC)
- Lifetime Achievement Award 1996 (ABI)
- 1997 Platinum Record for Exceptional Performance (ABI)
- The International Cultural Diploma 1996 (ABI)
- The Order of International Ambassador 1997 (IBC)
- Honorary Member of the International Biographical Center 1998 (IBC)
- Leading Intellectuals of the World 1999 (IBC)
- Key Award-The Leader in the Science Award 1996 (ABI)
- Kitazato University Gold Medal 1998, Tokyo
- Twenthieth Century Award for Achievement, IBC, 1997
- Gold Star Award, 1998, IBC

- Distinguished Leadership Award 1996 (ABI)
- 2000 Outstanding People of the 20th Century 1998
- Life Fellow of IBC (Cambrigde) 1999
- Deputy Director General IBC (Cambridge) 1999
- Medal of Mchithar Heraci 2000 (Armenia)
- **UNESCO's Kalinga Award Winner 1999**
- Vernadsky's Gold Star Order 2001 (the Highest Award of the International Interacademy Society)
- Paul Erlich Gold Medal-European Academy of Natural Sciences, 2003

Memberships

- Member of the National Academy of Sciences of Armenia 1994
- Fellow of the Scientific Council of the International College of Angiology (New-York) 1991
- Member of the International Academy of Sciences 1996
- Member of the International Informatization Academy 1996
- Member of the New York Academy of Sciences 1996
- Member of the Ararat International Academy of Sciences (Paris)
- President of the Pharmacological Society of Armenia 1993
- Member of the Management Advisory Committee of the Action Programme on Essential Drugs of WHO 1995-1998
- Member of the Board of the National Foundation of Science and Advanced Technologies of Armenia
- Member of the Research Board of Advisors, ABI
- Chairman of the Presidental Award Commission of Armenia in Medicine
- Member of Russian Academy of the Natural Sciences 2001 (Russia)
- Member of the Russian Medical-Technical Academy 2001 ;(Russia)
- Member of the European Advisory Committee of Health Research of WHO/Euro. (2001)

Inclusions in Books

- International WHO's WHO of Intellectuals, Twelfth Edition (IBC)
- International Directory of Distinguished Leadership, Sixth Edition (ABI)
- The First Five Hundred (IBC) 1997
- Five Hundred Leaders of Influence, 1997 Sixth Edition (ABI)
- 2000 Outstanding People of the 20th Century, IBC, 1997
- Leading Intellectuals of the World, Millenium Issue (ABI) of the Cerebral Circulation, 1972, Pergam
- Encyclopedia of Republic of Armenia
- International Encyclopedia of Pharmacology : The Pharmacology

Kalinga Laureate for Popularization of Science – 2000

Professor Ernst W. Hamburger, Brazil

[Born : 6th August, 1933, Berlin, Germany
Emigrated to Brazil with his Parents when he was still three years old...]

- **Science is the means to better the living condition of people & the goal can be achieved only when it is popularized amongst the masses.**

- **In Brazil, we are making Science Popular like football.**

... E.W. Hamburger

Prof. Ernst W. Hamburger- A Brief Profile

Ernst Wolfgang Hamburger is a German – born Brazilian Physicist and Popularizer of Science.

Born in Germany in 1933, Prof. Hamburger emigrated with his parents to Brazil when he was still three years old. He studied physics at the University of São Paulo and joined its faculty (Institute of Physics) soon after his graduation, in 1960. He is now a retired full professor of physics.

Prof. Hamburger is internationally known for his activities regarding public understanding of science. He is the director of Estação Ciência, an interactive science museum in São Paulo. He won the UNESCO Kalinga Prize for the Popularization of Science and the José Reis Award for the Divulgation of Science, the medal of the Brazilian Order of Scientific Merit, a member of the Brazilian Academy of Sciences.

Dr. Hamburger is married to Dr. Amélia I. Hamburger, also a physicist and colleague at the university. They have five children. One of them, Cao Hamburger, is a renowned film and TV director and scriptwriter.

Prof. Ernst Wolfgang Hamburger born in 1933 in Berlin, Immigrated to Brazil when he was only 3 years old. He became a naturalized Brazilian citizen in 1956.

Prof. Ernst Wolfgang Hamburger studied physics at the University of Sao Paolo in 1951 and began working in the Electrostatic Accelerator Laboratory as an undergraduate assistant in Nuclear Physics experiments. He devoted himself to this field of research for the next 20 years, measuring nuclear reaction mechanism and the structure of atomic nuclei. He studied light, intermediate and heavy nuclei, from Helium to Bismuth, and published over 20 papers on nuclear physics in main international journals. Many of his results were significant and kindled interest internationally. In this period, Prof. Hamburger also presented three theses, one at the University of Pittsburgh, USA and two the Sao Paolo University.

From 1968 on, he started to take a keen interest in, and develop, physics education. A curriculum Development Project for Secondary school physics was established, a group was set up for the production of films for physics teaching and an interdisciplinary graduate programme in Science Education was launched which has granted over 130 master's degrees. The dissertations deal with education and the diffusion of physical Sciences in schools, universities, the media and society.

In 1994 Prof. Hamburger received the Jose Reis Prize for Science Popularization bestowed by the National Research Council of Brazil. In 1994 he was invited to Estocao Ciencia, a Science Centre of the Sao Paolo University. Since then he has devoted himself to the activities of the Centre which has given 3500 square metres of its 5000 square metres to exhibitions and receives about 2 lakh visitors year (70% School Children). Prof. Hamburger has won several awards for his work at the Centre, for his efforts to popularize science, his TV programmers, educational software and video series.

Several books (on racial discrimination, race and diversity etc) were brought out in connection with the exhibition on the population of African origin in Brazil. More recently, a book on "Science Centres

and Museums-Visions and Experience" containing articles by 40 researchers and popularisers on the Brazilian experience in this field was published.

Prof. Ernst Wolfgang Hamburger organized the production of Physics films for use in university and middle school.

A printed newsletter is sent from the Centre every 2 or 3 months to all schools in the state of Sao Paolo because good communication with the school system is essential for the effectiveness of the Centre.

Since, 1996, the Centre has an internet site with an electronic version of the Newsletter and science popularization materials, particularly a series of attractive animation which is being developed to explain topics such as the Solar System, how to make a simple electric motor, how does laser work?

Prof Hamburger has devised a special programme for out-of-school and street children. They are socialized and educated, using the Centre's equipment, especially personal computers on which they learn to write and use educational software. This Project, called **Projeto Clicar** receives over 600 children a year, and has successfully established a relationship of trust with them as a first step to their 'inclusion'. The programme has attracted interest both in Brazil; and other countries-including the University of California-and has been rewarded as the best social project sponsored by business houses (in this case by the national petroleum company – Petrobras).

Prof. Hamburger has received the Kalinga Prize on 26.2.2001 for the year 2000 at New Delhi.

❑

Ernst Wolfgang Hamburger
Curiculum Vitae
April - 2008

- Born 6/8/1933 Berlin, Germany
- Immigrant in Brazil October 1936
- Naturalized Brazilian Citizen 7/27/1956
- Married to physicist and collaborator Amélia Império Hamburger, with whom has five children:
  Esther, Sonia, Carlos, Vera and Fernando.
- Has six grandchildren
- **Home Addres :** P. Monteiro Lobato 163
  São Paulo, SP 05506-030
  Phone 55 11 3031 8408,
  email ehamburger@if.usp.br; ehamburger@terra.com.br
  Brazil

RESUME OF CV AND DESCRIPTION OF CONTRIBUTION TO SCIENCE EDUCATION

1) Entered Physics course at University São Paulo in 1951 and started working in Electrostatic Accelerator Laboratory as undergraduate assistant in Nuclear Physics experiments. Devoted himself to this feld of research for next twenty years. Measured nuclear reaction cross sections in the million electron volt energy region, in order to better uderstand nuclear reaction mechanisms and obtain information on structure of atomic nuclei. Studied light, intermediate and heavy nuclei, from Helium to Bismuth. Published over twenty papers on Nuclear Physics in main international journals; several results were significant and much quoted. Presented three thesis in this period: Ph.D. at University of Pittsburgh, USA, 1959; *Livre Docente,* 1962 and *Catedra* (chair), 1968, at *Universidade de São Paulo (USP).*

2) **Teaches physics** at University since 1955. Was **Head of Department of Experimental Physics** for many years starting 1970.

3) Taught **Nuclear Physics** 4th year undergraduate and graduate course.

4) Since 1965 was in charge of 2 year **basic physics courses,** introduced many innovations to make course more interesting, up to date and effective. Wrote lecture notes, revised in successive years, printed by *Instituto de Fisica USP* for student use.

5) Emphasized **laboratory experiments** performed by students, introduced new experiments and course planning to make sure experiment and theory advanced together during school year, thus improving student understanding and success rates in courses (formerly lab and theory courses were poorly coordinated).

6) Introduced modern physics (e.g. **Relativity, Quantum and Particle Physics topics and experiments**) in first years.

7) Set up special **collection of demonstration experiments,** *Laboratorio de Demonstrações,* to be shown by teachers during lectures and recitation sessions. The demonstrations were also important inspiration for physics students who later became school teachers.

8) Since 1968 started to take physics education as an **object of investigation and development.** Gradually shifted from Nuclear Physics to Physics Education, to Science Education.

9) Led a **Curriculum Development Project** for secondary school physics, ***Projeto de Ensino de Física,*** published in 5 volumes, including a Teacher's Guide, by a Foundation connected to Ministry of Education of Brazil, FENAME/MEC, 1970-75. Author team included experienced secondary school teachers and university professors. Project was influenced by international developments such as PSSC and (Harvard) Project Physics in USA and Nuffield Physics Course in UK, but was appropriate to Brazilian conditions, where teachers in general have little content knowledge and less familiarity with physics experiments. Simple experiments were designed and included as a necessary part of the course; experimental kits on Mechanics, Electricity and Electromagnetism, were developed by the team and sold by the publisher. Two examples: the study of motion used a low friction inclined plane track made of steel strip on aluminum support and steel bearing ball; chronometers were mechanical and expensive at that time, so an inexpensive "sand chronometer" was developed, using the sandglass principle in a way that gave time measurements of precision 0.1 sec. For study of electromagnetism, a small easy to build motor was developed; the most difficult part to make, the commutator, was replaced by interrupting the current during half of each cycle, simply by scraping off the enamel insulation of the copper wire only from half the circumference; this design, first published in the volume on electromagnetism of this project, was later used in many books. These devices were developed by students and school teachers, coauthors of the project. The Project was successful in schools, was reprinted several times, but required more work from teachers, and was not widely used in schools. However it influenced texts published in the following years and was used in teacher training courses; also about one thousand teachers attended one-week in service courses based on the texts and experiments of these books, and teacher licensing courses in universities practiced with them.

10) Established a group for **production of films for physics teaching** in collaboration with the Cinema Department of the School for Communication and Arts of the University. Seventeen short "single concept" films, each 4 minutes long, were produced in the following years, aimed at general physics courses in universities. A visit by US physics teacher and film maker Al Baez in 1971 was helpful in establishing the program.

11) In 1970 presented a paper at the annual meeting of the Brazilian Society for the Progress of Science *(Sociedade Brasileira Para 0 Progresso da Ciência)* on **The University Entrance Exam and Distortions of the Educational System,** which was immediately published in the daily press and caused much discussion among educators. At that time the university entrance exams were widely considered, when well formulated, as selecting the "best" students. The paper pointed out that independently of how cleverly the exam was designed, it was in the first place a social and economic selection. Only students who went to a good school and had time and money to prepare well for the exam had a real chance (except for a few very talented and hard working poor students). Most of the successful candidates followed expensive cramming courses after regular school. These courses

followed the exams year after year and were able to predict the kinds of questions that were asked. The only way to select talents from all social and economic groups was, and is, to greatly improve public education, which is free and available to all. All this seems obvious today and is widely accepted by educators, but was not in 1970. Today, 38 years later, almost all children go to school for at least 8 years, but the quality of public schools is , in general, insufficient for them to enter public (free) universities; private (paid) universities have less competition at entrance, but are expensive and the quality of education is usually lower. The improvement of the quality of primary and secondary public education is still the greatest educational challenge in the country.

12) Proposed and directed, during initial years, an **Interdisciplinary Graduate Program in Science Education (Physics),** initiated 1969, formalized 1973, in collaboration with the School of Education, which has granted over 230 masters degrees as of 2008. This was the first interdisciplinary graduate program in University of Sao Paulo. The dissertations are about education and diffusion of physical sciences in schools, universities, the media and society. Here the various development projects in physics education were subject of research and dissertations. This program attracted teachers interested in graduate studies aimed at improving teaching and learning of physics; many of the graduates later set up similar R & D programs in other universities.

13) Studied the working of the **university physics curriculum,** trying to understand and correct the **high flunking and dropout rates of students,** principally during the first year of university. Difficulties of abstract thinking and of mathematical abilities were not sufficiently taken into account in introductory Calculus and Physics courses. Laboratory experiments could be exploited to ease some of these difficulties, by furnishing concrete examples of abstract operations. For example the study of Rotation of Rigid Bodies and the concept of Angular Momentum as a (axial) vector quantity is much easier if the student holds the axle of a spinning bicycle wheel in his hands and changes its direction, and examines the fall of a weight tied to a string wound around a solid cylinder with fixed axle.

14) Was **advisor of seventeen graduate students** in the program on science education, who presented research dissertations on topics such as Teacher In-Service Training Program, Science Exhibition for Elementary School Teacher Pre-Service Training, A Course on Gravitation for Elementary School Teachers, Science Education based on Community Problems, A Course on Physics of Environment at University of Rio Grande do Norte, The Undergraduate Physics Course at University of São Paulo, Undergraduate General Physics Laboratory, Analysis of the *Projeto de Ensino de Física,* Production, Use and Evaluation of Teaching Films, An Electricity Course for Knowledge Transfer, Limitations in Understanding of Basic Concepts in Physics, *Projeto de Ensino de Física* in Programmed Individual Instruction. Also advised three master degree students in Nuclear Physics.

15) Was advisor of seven doctoral thesis, of which one in Nuclear Physics and seven in Physics Education; these were on topics similar to the above.

16) Organized, on behalf of the Brazilian Physical Society, *Sociedade Brasileira Fisica,* the first **National Symposium on Physics Teaching, *Simpósio Nacional de Ensino de Física,*** in 1970, and again in 1976 the third Symposium. These symposia, held initially every three, and later every two, years, are to this day important meetings to discuss the state of the art of physics teaching, and to bring together physics and science school teachers, university professors and researchers. During the military dictatorship in Brazil, 1964-1985, when communication media were severely censored, scientific and professional meetings were also important to discuss general subjects.

17) As member of the Governing Board, ***Directoria, of Sociedade Brasileira de Fisica,*** 1969-71 and 1976-78, and later of the society's general council, Conselho, has striven to keep both research and teaching questions as concerns of the same Physical Society. Believes that if research and teaching and learning are thought of concomitantly, all do better, for research is but a way of learning, from nature as teacher.

18) Has organized and participated as author in teams to write texts for physics books, story boards for physics films, for Television programs for physics teaching, and for science exhibitions.

19) Was **adviser for Physics TV programs** of the Educational ***TV Station TV Cultura-Canal 2*** in Sao Paulo in the series Colegio 2, aimed at secondary schools, 1975.

20) Later was **supervisor of the physics content** for national **TV programs and accompanying textbooks** produced for Brazils largest TV network, ***Rede Globo, Telecurso 2000,*** with support of the São Paulo Industry Federation, *Federação das Industrias do Estado de S. Paulo, FIESP,* aimed at secondary school level, but to be used also by adult students working in industries. These courses were very successful and were shown for many years on open TV and as video cassettes in institutions.

21) In the Physics Institute of the University, and later in *Estação Ciência,* **organized (taught** many of them) over a hundred **in service training courses for school teachers,** introducing modern teaching methods and modern science content.

22) In the **Physics Institute** organized **science popularization activities: talks, courses, exhibitions** of experiments and posters, visited by tens of thousands school students and other interested people. The first exhibitions, very successful with large public, were on Halley's Comet during the approximation in 1986, and on Energy, in 1987, sponsored by an electricity company, CESP. Both required more space than the Physics Institute had, and were shown in other buildings on or near campus. The success showed that there was much interested public for science exhibitions.

23) The Physics Institute has a history in research significant in Brazilian science education, and this should be known to students and younger faculty. For this purpose, EWH led organization of symposia, publications and exhibitions on important research work done by faculty of the Institute in the past:

    i) 1984-chair of commission for homage to 70th birthday of prof. Mario Schenberg, including a) International Symposium on Theoretical Physics; b) Publication of Proceedings of this Symposium (org.A.L.R.Barros); c) Special issue of Revista Brasileira de Fisica ("Festschrift" org. N.Fernandes); d) publication of two books by Schenberg: ***Pensando a Fisica*** (org A.I. Hamburger) and ***Mário Schenberg: Entrevistas*** (org. J.L. Goldfarb and G. Guinsburg);

    ii) 1988- **"40 years of the discovery of the pi-meson",** homage to prof. Cesar Lattes, symposium and exhibition;

    iii) 1990- **"50 years since discovery of Penetrating Showers in Cosmic Rays",** research led by institute founder Prof. G. Wataghin;

    iv) 1992- **"A History of Nuclear Physics",** for the 70th birthday of Prof. Oscar Sala.

24) Published small **book** on ***O que é Fisica?*** **(What is Physics?)** in 1984, directed to general public, specially school students; eighth edition published 2007.

25) In 1992 startedf, with E. Silva, a new **physics experiment on Cosmic Ray Detection,** in collaboration with colleagues of his and other institute, including INFN in Italy. An electronic telescope for high energy muons of cosmic origin, to look for possible anisotropies or "point" sources in the sky was built and tested. **A smaller instrument, for teaching and demonstration** purposes, was also developed and used in Physics Institute and at *Estação Ciência.*

26) In 1994 was invited to ***direct Estação Ciência,*** a Science Center in the city of S. Paulo, established 1987 and belonging to University of S. Paulo since 1990, housed in building of an old factory. Devoted himself to increasing and improving the activities of the center. Below are mentioned some of his initiatives, most of which depended on the collaboration of university colleagues and staff.

27) Obtained collaboration of faculty and funds from government and private agencies to set up or borrow **many new exhibitions:** Nuclear Physics and Cosmic Rays, Thermodynamics and Energy, Marine Biology, History and Anthropology of Population of African Origin in Brazil, Way of life of Xavantes (American Indian tribe) in state of Mato Grosso, Plume Art of American Indians in Brazil, History and Physics of Photogrphy and Cinema, Astrophysics and Cosmology, Medieval Castles and Feudalism, Urban Development of S. Paulo and other Cities, Lightning and Thunderstorms, History of Highway Transportation, among others. The permanent exhibition was substantially enlarged with new experiments and exhibits, by incorporating part of the building which had not yet been refurbished.

28) ***Estação Ciência*** now has an area of 5 000 square meters, being about 3 500 for exhibitions. It receives over 300 000 visitors per years, of which ca. 70% are school children who come in buses. There is a team of **university students who act as explainers** in the exhibitions. The selection, training and supervision of these explainers is an important part of the working of the center. Often these students later become teachers.

29) Since 1995 there is a special program, set up with the help of specialized educators, **for children who spend most of their time in the streets** and often do not go to school. The children are socialized and educated using the centers' equipment, specially personal computers, where they learn to write and use educational software. This ***Projeto Clicar*** receives hundreds of children per year, and has been very successful in establishing a relationship of trust, first step to an inclusion of this social sector, and return to school. The program has attracted much interest from projects with similar aims in Brazil and in other countries (e.g. University of California), from the media and has received a prize Top Social 2000 as the best social project sponsored by companies in the country, bestowed by *ADVB – Associação de Dirigentes de Venda e Marketing do Brasil.* It is sponsored by the national petroleum company Petrobras.

30) *Estação Ciência* has co-produced several **video programs for science popularization on TV channels,** upon initiative and coordination of EWH. University scientists help prepare the script or story board and TV professionals direct and produce. The most successful is a 1996 series of ten one minute clips on basic scientific topics, ***Minuto Científico,*** directed by Cao Hamburger : Black Hole, Theory of Relativity, What are we made of ? Elementary Particles, and others, produced with the educational TV station *TVCultura,* which is still occasionally broadcast, as in 2008. The series was presented at festivals in Brazil and abroad and received much applause and several prizes: see below. Another co-production with *TVCultura* is "Visions of Liberty", a 30 min video inspired by the exhibition on Slavery and the African origin population in Brazil. With the Physics Institute and the Cinema Department of the University was produced "Cosmic Radiation", directed by M. Tassara, based on talk by EWH. Many TV channels have run programs filmed in *Estação Ciência,* e.g. the

physics part of the series *Telecurso 2000.*

31) A **printed Newsletter** was sent, up to 2002, from *Estação Ciência* every two or three months to all schools of the state of S. Paulo.Good communication with the school system is essential for the effectiveness of the Science Center. Since 1996 the center also has a **site on the Internet,** with an electronic version of the Newsletter and the science popularization materials, particularly a series of **interactive animation** which is being developed by M. Matsukuma to explain certain concepts: the Solar System, Making a simple electric motor, how does a laser work? And others.

32) **Educational Software** for physics and mathematics was developed, e.g. *Oficina de Funções* (Mathematical Function Workshop) received a prize from the Ministry of Education (1997). Urban Birds is a multimedia program inspired by an exhibit in the *Estação Ciência.*

33) We cite some of several **books** organized by *Estação Ciência* and several publishers, with EWH as co-author and / or co-organizer. **Centros e Museus de *Ciências – Visões e Experiências*** (1998) about Science Centers and Museums in Brazil, organized by then staff member S. Crestana, contains papers by forty science researchers and popularizers.

34) A **course** directed to science center personnel of Brazil and Latin America, organized at *Estação Ciência* in 2000, taught by experienced specialists from this region, was published in book form ***Educação para Ciência*** (2001), org. S Crestana, EWH et al. It includes descriptions of most interactive science centers in Brazil.

35) From 1995 to 2002 *Estação Ciência* organized a yearly fair of materials for teaching and popularization of science, ***Mostra de Material de Divulgação e Ensino de Ciências,*** including talks by teachers and scientists. About one hundred exhibitors, universities and schools, showed the teachers, students and administrators who visit the fair, about ten thousand, the latest developments in equipment, books, software, etc. The proceedings of four fairs were later published as books: The **Challenge of Teaching Sciences in Century XXI** (2000); **Science and Social Inclusion** (2002); **Science and Art – Discovery and Imaginary** (2003), and **Scientific Knowledge and Everyday Knowledge** (2004), all org. by staff member C. Matos with Introduction of EWH. After EWH's retirement, in 2003, the fairs were discontinued.

36) On the other hand, three books, organized by anthropologists, were co-published with the University of S. Paulo Press about themes from the exhibition on Slavery and African Origin Population.

37) *Estação Ciência* since 1995 hosts, invited by EWH, every year, an International Scientific Video Festival, ***VerCiência,*** organized by video firm Mediatech in Rio de Janeiro, São Paulo and, more recently, other cities, showing a selection of the world's best scientific videos.

38) In 2003-2004 the University Coordination of Social Communication and *Estação Ciência* organized seminars on "Science and Society-Journalistic Mediation" and published a book *Ciência e Sociedade – Mediações Jornalisticas,* org. Cremilda Medina, EWH author of chapter.

39) Organized traveling Exhibition **Scientific Aspects of Space Travel,** (2004) for general public (20 posters, 8 experiments & multimedia), for Brazilian Space Agency *(AEB), Estação Ciência da USP.*

40) Organized Traveling Exhibition on **Physical Sciences in Brazil,** for general public (40 posters, 4 experiments and 4 multimedia presentations), 2005, sponsored by Brazilian Physical Society (SBF), Ministry of Science Technology (MCT), Science Foundation of State of S. Paulo *(FAPESP), Estação Ciência da USP,* for International Physics Year.

41) Since 2001, until 2008, EWH has been **coordinator** of a Program of the *Academia Brasileira de Ciência* (Brazilian National Academy of Sciences, of which he is a member) for furthering **Inquiry Based Science Education (IBSE)** in Brazil;he also coordinated this ***Programa ABC na Educação Cientifica- Mão na Massa*** locally in São Paulo, in Estação Ciência, until 2009. In recent years this program has been his principal educational task.

42) The Programe is aimed at the initial school years, for ages 6 to 13, and organizes in service training for teachers, not only of science content, but also of how to conduct experiments and observations in class, with active participation of pupils in all stages of the process, from the discussion to define the question to be answered, to the planning, performance and analysis of results. Since elementary school teachers and administrators usually have little background in science, especially in inquiry and experimentation, it takes some time for teachers to feel sure of themselves to adopt this methodology. At present the program is being tried in twelve cities in Brazil, with good results. The largest group is in S.Paulo, with about one hundred municipal schools. Several educational research papers on this work have been presented at professional meetings.

43) In each city a university or science research institution collaborates with the municipal or state school system in the preparation of teaching materials and development sessions with teachers and educational personnel.

44) The Program quoted above is similar to Programs which exist in the USA, France and about thirty other countries. They have the support of the respective National Academies of Science and of the international, organization **Inter-Academy Panel (IAP).** The IAP organized a working group to study the evaluation of Inquiry Based Science Education (IBSE) Programs, of which EWH was a member and is co-author of the **Report of the Working Group on International Collaboration in the Evaluation of Inquiry-Based Science Education (IBSE) programs,** published by the Academy of Sciences of Chile in 2006.

45) In S. Paulo EWH has supervised the **preparation of teacher training** for the program **and development of texts and experiments** for teachers to help plan and perform activities with the children in class. The largest program is a collaboration with the municipal school system of the city of S. Paulo, introducing Inquiry Based Science Education in about one hundred schools situated in different regions of the municipality. In 2007 the first formal **class room evaluation** of the program was carried out, which showed positive results. The same was true of the second evaluation, carried out in 2008. Both evaluations were planned together by the teams of the Municipal Education Authority and *Estação Ciência*, and required students to carry out a simple science experimental observations (physics in 2007, botany in 2008), working in small groups, and to answer a short test.

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Speech Delivered by Prof. Ernst W. Hamburger During Civic Reception at Bhubaneswar

UNESCO Press Release

"Mr Hamburger has contributed to the development of the Estação Ciência, through the organization of many exhibitions and the mobilization of sponsors for innovative activities such as the Projeto Clicar, created in 1996 with the support of the national petroleum company, Petrobras. Estação Ciência receives 25,000 visitors a month, mostly children and adolescents. Projeto Clicar was established to provide a special space with computer equipment to young people who wish to explore independently the various facets of human knowledge. In 1999, close to 600 children from troubled social or family backgrounds took part in the project. Educators and students assist the children in their exploration."

Prof. Hamburger, who was honoured at a civic function here on Thursday, said that the days when fruits of scientific research remained a close preserve of a few had been over with the advent of electronic media. The new system of communication has now created a tremendous scope for taking science to the doorstep of people, he pointed out.

He said science is certainly not the final answer to poverty. But it is surely a definite means to empower people by which they can be made self-confident to move in the path of progress. To drive home the point, he cited the public response to the science museum in his country, Brazil, where 25 percent people are "extremely poor" and football is worshipped more than anything else.

He said the establishment of the museum had proved the deep-seated longing in people to use science for their development. It attracts more than 2 lakh visitors every year, most of whom are school children belonging to the disadvantaged section of the society. "When they sit before the computer and operate it you must see them to believe the kind of self-confidence generated in their minds", he pointed out. He said in Brazil nearly 95 percent children go to school, a situation that was not seen decades back. Populrisation of science played a key role in bringing this change, thanks to the electronic media. Almost every family in Brazil has either a radio or a television which regularly run programmes on science prepared in common man's language, taking people' access to information to a new height. "We are making science popular like football", he remarked .

The Kalinga prize for popularizing science is given every year by UNESCO on behalf of Kalinga foundation trust set up in 1950 by statesman and freedom fighter late Biju Patnaik. The prize money carries 1000 pounds and the Albert Einstein silver medal. According to managing trustee of Kalinga foundation trust, Kamini Patnaik, the prize money is small it had nevertheless attracted several illustrious scientist, including 6 Nobel prize winners. The prize money is being doubled from 2001 and efforts are on to increase the amount to 10,000 pounds soon, he added.

The latest winner Prof. Hamburger, who was born in Germany in 1933, emigrated to Brazil at the age of 3 with his parents, where he has been teaching physics in Sao Paulo since 1960. He has contributed to the popularization of science through numberous articles and his book- O Que e Fisisca? – as well as programmes in television. In 1964 he was also given Jose Reis science populrisation prize and became director of the Estacao Ciencia, part of the UNESCO- supported science popularization network in Latin America and the Caribbean." -

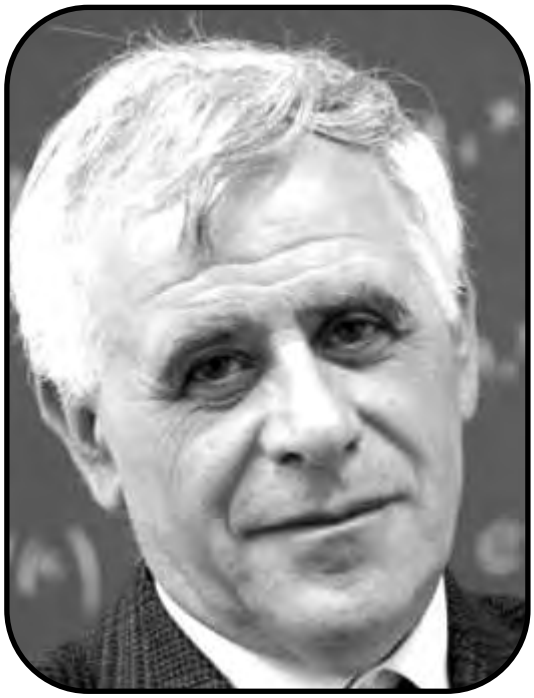
"The Times of India", March 2nd, 2001.

Science is certainly not the final answer to poverty. But it is surely a definite means to empower people by which they can be made self confident to move in the path of progress.

… E.W. Hamburger

Kalinga Laureate for Popularization of Science - 2001

Professor Stefano Fantoni, Italy



[Born : 1945, Taranto, Italy...]

- **The Popularisation of Science is today becoming a fundamental issue in the Political Strategies of the development of countries all over the world.**
- **In the 21st Century, Popularising science is not nearly a Philanthropic, democratic option, but rather a definite need of our society.**
- **Why to communicate Science? Because in lack of a true dialogue between the scientific community & the citizens, science can die.**

...Stefano Fantoni

CURRICULUM VITAE OF STEFANO FANTONI

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"Alice Padoan" <padoan@sissa.it>

BORN : 1945, Taranto (Italy)

EDUCATION

1968 : Degree ' Dottore in Fisica', Pisa (Italy)

1971 : PhD ' Perfezionamento in Fisica', Scuola Normale Superiore, Pisa (Italy)

PROFESSIONAL EXPERIENCE

1972-1986 : Associate professor at the Department of Physics, Pisa (Italy)

1986-1992 : Full Professor at the Department of Physics, Lecce (Italy)

1992-today : Full Professor at SISSA, Trieste (Italy)

1991-2000 : Director of the SISSA Interdisciplinary Laboratory, Trieste (Italy)

1994-2004 : Director of the SISSA Master in Science Communication, Trieste (Italy)

2004 - today : Director of SISSA

VISITS AT OTHER SCIENTIFIC INSTITUTIONS

1977 : Visiting Scientist at the Niels Bohr Institute in Copenhagen, (Denmark) (three months)

1979 : Visiting Scientist at the Department of Physics, Koln, (Germany), (three months)

1981 - 1982 : Visiting Associate Professor at the Department of Physics, University of Illinois at Urbana - Champaign (USA)

1984 : Visiting Associate Professor at the Department of Physics, University of Illinois at Urbana - Champaign (USA) (six months)

1990 : Visiting Professor at Jefferson Laboratory (CEBAF), Newport News, Virginia (USA) (three months)

2000 : Visiting Professor at the Theory Center in Seattle, Washington (USA), (one month)

SCIENTIFIC INTEREST

World leader in the development of Many-Body methods for strongly correlated Fermi systems :

- Fermi Hyper-Netted Chain (FHNC) theory
- Correlated Basis Function theory
- Auxiliary Field Diffusion Monte Carlo Method

Research area of Interest :

- Nuclear Physics : structural and dynamical properties of nucleon matter and nuclei
- Nuclear Astrophysics : hadronic matter at high density and low temperature in compact stars and supernovae
- Low temperature Physics : structural and dynamical properties of quantum liquids and droplets; BEC and superfluidity in dilute atomic gas
- Strongly correlated electron systems

SCIENTIFIC PRODUCTION

- Co-editor of several Conference Proceedings
- Author or co-author of about 200 papes published in international journals and refereed Conference Proceedings. These papers have more than 1,500 citations from more than 600 other scientific articles in the international literature over the past 10 years (source : ISI, 2005). Ten of the most significant papers are given in the following :
- **S. Paolini, S. Fantoni, S. Moroni et al.** "Computational Spectroscopy of helium solvated molecules: Effective inertia, from small He clusters towards the nanodroplet region", Journ. Of Chem. Phys., 123, 114306 (2005)
- **S. Moroni, A. Sarsa, S. Fantoni, K.E. Schmidt and S. Baroni,** "Structure, rotational dynamics and superfluidity of OCS doped He clusters", Phys. Rev. Letters, 90, 143201 (2003);
- **S. Fantoni, A. Sarsa and K.E. Schmidt,** "Spin susceptibility of neutron matter at zero temperature", Phys. Rev. Lett., 87,81101 (2001);
- **S. Giovannazzi, A. Smerzi and S. Fantoni,** "Josephson effects in dilute Bose- Einstein condensates", Phys. Rev. Lett., 84, 4521 (2000);
- **S Moroni, F. Pederiva, S. Fantoni and M. Boninsegni,** "Equation of state of solid He-4", Phys. Rev. Lett., 84, 2650 (2000);
- **K.E. Schmidt and S. Fantoni,** "A quantum Monte Carlo method for nucleon systems", Phys. Lett., B446,99 (1999);
- **F. Pederiva, A. Ferrante, S. Fantoni and L. Reatto,** "Quantum theory of solid - liquid coexistence and interface", Phys. Rev. Lett., 72,2589 (1994);
- **O. Benhar, A. Fabrocini, S. Fantoni, G.A. Miller, V.R. Pandharipande, I. Sick,** "Scattering of few GeV electrons by nuclear matter", Phys. Rev. C44, 2328 (1991);
- **O. Benhar, A. Fabrocini and S. Fantoni,** The nuclear spectral function in infinite nuclear matter, Nucl.Phys. A505, 267 (1989);
- **S. Fantoni, V. R. Pandharipande,** "Momentum distribution of nucleons in nuclear matter", Nucl. Phys. A427, 473 (1984);

- **S. Fantoni, S. Rosati,** "The Hyper - Netted-Chain approximation for fermion systems", Nuovo Cimento, A25, 593 (1975);

OTHER PROFESSIONAL ACTIVITIES

- Referee of several research funding agencies, including NSF (USA) and the italian "Comitato dei Garanti"
- Referee of several scientific journals, including Phys. Rev. (A-C and Letters), Phys. Lett., Nucl. Phys., Journ. Low Temp. Phys.
- Organizer of several international conferences and schools
- Founder of the Elba International Physics Centre (EIPC), Isola d'Elba, Italy;
- Director of EIPC from 1986 to 1992
- One of founders of the European Centre for Theoretical studies in Nuclear Physics and Related Areas, ECT*, Trento, Italy
- Member of the Board of Directors of ECT* (1993-1995)
- Member of the editorial board of the series "Recent Progress in Many-Body theories", World Scientific.
- Associate editor of Nuclear Physics A, North-Holland
- Member of the scientific council of the Theory group of INFN (1978-1980)
- Member of the Program Advisory Committee (PAC) of the

  Jefferson Laboratory (CEBAF), Newport News, Virginia, (USA) (1989--1993)
- PAC member of Legnaro Laboratories of INFN, Legnaro, Italy (1991-1993)
- Chairman of the PAC of the Legnaro Laboratories of INFN, Legnaro, Italy (1994-1996)
- Italian delegate in the OCSE committee "Megaforum Science : Nuclear Physics", 1997-1998
- Member of the International Advisory Committee of the Institute for Advanced Studies, *Collegium Budapest,* 2003-today
- Founder of the first Italian Master in Science Communication, SISSA, Trieste, Italy, 1993
- Member of the Governamental Committee on "Public Understanding of Science", 1995-1997
- Vice-President of the *Fondazione sulla libertá delle Scienze,* Trieste, Italy

PRODUCTION IN POPULARIZATION OF SCIENCE

- Organizer of several national meetings on popularization of science
- Author of several a rticles in newspapers and journals and research paper on science communication;
- Co-editor of more than 20 books in popularization of science
- **2001 Kalinga Prize, awarded by UNESCO**
- 2002 Premio Piazzano

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Kalinga Prize for the Popularization of Science

Awarded to
Professor Stefano Fantoni (Italy)

During a Ceremony held at UNESCO Headquarters in Paris
Room XII, 6:30 pm, 19 October 2001

Acceptance Speech

Popularizing Science in the Third Millennium

S. Fantoni
International School for Advanced Studies, AISSA
Via Beirut 2/4, I-34014 Trieste, Italy

Whatever can be said, can be said clearly;
and whereof one cannot speak, thereof one should keep silent
L. Wittgenstein

The popularization of Science is today becoming a fundamental issue in the political strategies of the development of countries all over the world. A number of United Nations' committees, the European Union, public and private institutions belonging to different countries have been frequently indicating that, communicating the achievements of science to the general public, in a clear and understandable way, has to be considered as an important priority.

Our modern societies, all strongly based on technological improvements, consistently demand a solid scientific and technological knowledge from those who wish to be considered citizens. Democracy cannot then be considered to be fully achieved if we cannot guarantee that the people have an understanding of the major scientific strategies as well as a high level knowledge of technological expertise.

Not only that.l A number of sensational events recently, such as the debates on the aplications of modern biotechnology or on the electromagnetic pollution, those on global environment or on the Creutzfeld-Jacob disease, have shown the importance of a diffuse scientific literacy. But, more than that, they have shown that there is a need for a real interaction between the scientific community and the other components of our society, which has to be both bidirectional and dialogical.

In the twenty first century, popularizing science is not merely a philanthropic, democratic option, but rather a definite need of our society.

Nonetheless, our society seems to suffer a sort of schizophrenia towards science. On one side many people believe that the future social dialectical barier will be between those who know and those who do not know rather than between the rich and the poor people, and some times one has even seen science unappropriately used to give credit to something that has nothing to do with it. Therefore, science is the

truth. On the other side, there is also a diffused feeling of uneasiness, if not of fear, of the great potentiality that it can offer. Therefore science is also a danger.

I believe that the above paradox, rather than being due to an inadequate level of the current science popularization, infact manifests a dangerous tendency in our society, which may even weaken the freedom of scientists' research, and, as a consequence, the science itself. What seems to be attractive in science is no longer its being a high intellectual activity, a continuous human search to represent and predict nature, but for what it can produce in terms of controlling, and therefore in terms of power, of mankind on his sorroundings and his fellows.

We have to remind ourselves that scientific culture is after all an accidental event in human history. it may die if we do not take care to keep it alive. When we celebrate the outstanding successes of our science, originally developed on the shore of the Mediterranean, we often forget that science has experienced much less glorious times. The famous Hellenistic science, grown on the shore of Asia Minor, on the Ionio sea, with Talete, died in Alessandria after six or seven centuries. It left only some very faint tracks of its enormous successes, to begin again around the XIV and the XV centuries when the Arab-Islamic science characterized the second scientific era that the Mediterranean has experienced.

Therefore science can die. Our beloved science, only four centuries old, can die, and that may happen not in a catastrofic or spectacular way, but simply transforming itself without us even noticing. And, paradoxically, it is threatened by its own successes. It looks inevitably tied to the fundamental technological fall-outs that it has generated. Our present technical capability has grown up against a deep comprehension of the mechanisms governing nature. In too many fields today we are able to do many more things than we can actually understand.

Several people, including some scientific communicators, believe that the time of knowledge is past. What we have to do is just to convey information, in the most efficient, qualified, technically advanced way, but to convey only information. That is to say that, given the fact that we are losing arms, legs and in general the perception of our body, we have to lose also our human capability to look, listen and ask the world questions. Such an attitude which relies more and more on an easy, comfortable life, and on what cannot be avoided, remind me of Dedalo who obeys king Minosse, and afterwards becomes his victim.

All this tells us that popularizing science is not only fundamental for the development of policies all lover the world and to reach a computed democracy in our societies, but also to keep science alive. It is then a duty of scientists to convey clearly the relevance of their researches to every body either directly or indirectly through science writers. Also for the survival of science.

However, it is not sufficient to popularize the scientific contents, eventually pointing out the great discoveries only. We need to popularize also scientific culture and its methodologies; we need to break the prejudices around science, viewed as infallible, unreachable and pure. The real strength of scientific culture, and in general of culture, stands in its lack of purity. In its being continuously contaminated by ideas, fashions, criticisms, by not posing any limit to the influence from cultures, behaviors, customs, languages which may be very different from each other. All this favours creativity in science. There is nothing, or at least there should not be anything, which is less ideologized than scientific culture, and at the

same time nothing is more universal than it. We want to show to the people that the universality of knowledge pops up not from a presumed purity, but rather from its way fo looking at the world, from the freedom of the research within a rigid ratinalism, and , in reality, from constant self criticism. “You teacher”, paraphrasing Bertold Brecht, “do not forget that you are what you are because you doubted your teachers !”

Therefor, universalism, criticism, unitarity of knowledge, relevance of basic resarch, namely research which is not immediately addressing any practical application, attention towards different cultures, consideration of our history, and attention not merely to the technical aspects of the scientists, but also to the cultural ones.

These are subjects that a science writer should popularize together with a clear, and at the same time correct, exposition of the fundamental lines of the science he is writing.

This is what my collaborators, both the scientists and the science writers, are trying to teach together with me to our students at the SISSA School in Science Communication in Trieste. And this is what I believe UNESCO has taken into account in awarding me with the prestgious Kalinga Prize.

Kalinga Laureate for Popularization of Science - 2002

Ms. Marisela Salvatierra, Venezuela

[Born... 6th October, 2003 (Died)]

- **Science Communication opens people's eyes'**
- **Ms Salvatierra regrets that the Production of Scientific Literature for Children & General Public in her home country Venezuela is modest. There are currently only 45 titles for childern, 40 for teenagers & 450 for the general public, she notes.**

…Marisela Salvatierra

Marisela Salvatierra

A Life Devoted to Popularizing Environmental Science

For her outstanding contribution in the field of Environmental Journalism, Marisela Salvatierra gets Kalinga Prize for the year 2002.

Venezuelan journalist Marisela Salvatierra, who was awarded with the UNESCO Kalinga Prize for the year 2002 for her great work in Scientific Spreading, passed away in Caracas because of a laborious disease. Mrs. Salvatierra, a lawyer by profession, has been pleasantly and most simply diffusing the complicated world of science and the technology and for that reason and in recognition to her twenty-five (25) years of uninterrupted professional work, she has been granted with the coveted mentioned Prize.

Journalist Salvatierra was the fourth Venezuelan in obtaining this prestigious international award. Previously the Prize was granted to Augusto Pi Suñer (1955), Aristides Bastidas (1980) and Marcel Roche (1987).

The UNESCO Kalinga Prize is granted every year to outstanding signalers who have contributed immencely to place science and the technology within the reach of the public in general. This award is conferred by UNESCO jointly with Kalinga Foundation Trust of India.

Venezuelan journalist Marisela Salvatierra is the winner of UNESCO's Kalinga Prize for the Popularization of Science 2002. The prize comes in recognition of her remarkable 26 year career in science communication and environmental education in Latin America.

Ms Salvatierra receives the sum of £2,000 and a UNESCO Albert Einstein Silver Medal. As holder of the Ruchi Ram Sahni Chair, which comprises a token honorarium of US$2,000, she will travel to India for a period of two to four weeks as the guest of the Government of India. The Ruchi Ram Sahni Chair was introduced by the Government of India in 2001 to mark the prize's 50th anniversary.

During her stay, Ms Salvatierra will interact with the Indian scientific community, young students and the public at large to convey her personal message in science popularization and establish ties with India.

'Science communication opens people's eyes', she believes, 'combats the scourge of pseudo-science and democratizes the benefits of knowledge, since one of the objectives of science popularization is to enable the majority to participate democratically in the discoveries of the minority.'

Ms Salvatierra produces and conducts the weekly radio programme on environmental analysis, Evolution, and directs the Foundation on Environmental Communication Development (Fundecam).

She is a former Professor of Journalism on Environment and Development, and Environmental Education, at the Social Communication School of the Central University of Venezuela. She has been President of the Environmental Commission of Venezuela's Scientific Journalism Circle and was responsible for environmental issues at the National School of

Journalists. She was also a driving force behind the National Programme of Development and Consolidation of Environmental Journalism in Venezuela, which included the design of an environmental training programme for active journalists.

For ten years, she headed the government programme of environmental analysis. She has also worked as Editor-in-Chief of the magazine *Profauna,* as Editor of the technical magazine, *Environment,* and as the Venezuelan correspondent for the Latin American edition of Environment Watch.

Ms Salvatierra regrets that the production of scientific literature for children and the general public in her home country is modest. 'There are currently only 45 titles for children, 40 for teenagers and 450 for the general public', she notes". Among Salvatierra's own titles are *Atmospheric Pollution, The Process of Environmental Deterioration in Venezuela's History, The Animal Population in Venezuela and Why do we get flooded ?* from the series Cuadernos Maraven.

The annual Kalinga Prize for the Popularization of Science was created by UNESCO and the Kalinga Foundation Trust in India in 1951 to encourage a dialogue between scientists and the general public. Some six Nobel Prize laureates figure among past recipients.

Each year, applications for the Kalinga Prize must reach UNESCO via the candidate's National Commission for UNESCO by 15 May.

For Further information, go to:

www.unesco.org/science/pao/global.htm;

for the list of National Commissions:

www.unesco.org/ncp/natcom/

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"Kalinga is a Message of Peace for the Venezuelans"

The National, 06 of November of 2002

by

Yelitza Izalla Yánez

The journalist **Marisela Salvatierra** is the fourth Venezuelan and first woman of the country that gains one of the most important recognitions that the Organization of Nations United for the Education, Science and the Culture to the publishing ones of science in the world grants.

Marisela Salvatierra, specialist in environmental journalism, that has forged her race during 26 years, gained the prize Kalinga de Scientific Divulgacio'n 2002, that the organization of Nations United for the Education, Science and the Culture to the people grants who have dedicated their professional life to contribute with the circulation of information and scientific research.

Salvatierra is the first woman and fourth Venezuelan who gains the prize. In 1955, it was granted to the doctor of Spanish origin Augusto Pi Suñer; in 1980, journalist Arístides Bastidas gained and in 1987 the award took the scientist to it Marcel Roche. "Kalinga is a message of peace for the Venezuelans. This prize was not granted it to me but to the country, that at the moment a crisis crosses very hard. The city that gives the name him to this prize seated preceding in the world and transformed to a dynasty into an example of peace and conexistence. It wanted that all the Venezuelans we followed that message", indicated the journalist. It remembered that Kalinga, kingdom of the Eastern coast of India, was a city model until was invaded by the dynasty of the Asoka soldier who, after ending the place, decided to change his way to govern and to dedicate himself to the Buddhism. "the change was one of the sources of inspiration of Gandhi, and I hope that it is an example for in a while so fundamental to us for the history of the country", it said.

Postulated unanimously

Marisela Salvatierra was postulated, by unanimous decision, by the National School of Journalists, the Circle of Scientific Journalism, the Central University of Venezuela- where it gave classes-, the Ministry of the Atmosphere and the Natural Resources and by some non-governmental organizations dedicated to the defense of the medio.ambiente, which now turned it the representative of Venezuela before UNESCO and before the world, because the award of this year took. At the moment, the journalist is member of the Circle of Latin American Scientific Journalism and president of the Foundation for the Development of the Environmental Communication for Latin America and the Caribbean.

For 10 years, Evolution has been leading a program in called Caracas Radio Radio, which is dedicated to the analysis of environmental problems and other facets of the ecological subject. Salvatierra dedicated part of its race to the investigation, because in the Network of National Libraries compendiums rest on atmosphere dedicated to the students of basic education, as well as a series on the environmental systems of

Venezuela. “These works allowed me to leave shaped in books the wealth of our country. One of my greater satisfactions is that they have served for important investigations, that they have contributed with the development of the subject in the country,” said the winner. In the UCV, Salvatierra also seeded her environmentalist seed in the school of Social Communication, because it distributed the chairs of Journalism and Environmental Education and Journalism on Atmosphere and Development.

According to the representatives of the Circle of Scientific Journalism, Salvatierra has spread environmentalist conscience not only in Venezuela, but in Latin America and Europe. “Its work was considered as a contribution to impel the growth of the ecological communication, through diverse fronts that include the media, teaching, production of educative materials, as well as activities of investigation directed to change paradigms and to support the nature-society relations”.

Kalinga Laureate for Popularization of Science - 2003

Prof Pervez Amirali Hoodbhoy, Pakistan

[Birth : 11th July, 1950, Karachi, Pakistan …]

- **Critical minds alone can take us forward:**
- **Education is not about getting degrees or jobs but about creating a tolerant, caring, Progressive & forward-looking society.**

Prominent Environmental & Social Activist Dr. Pervez Amirali Hoodbhoy

CURRICULUM VITAE
of
Prof. PERVEZ AMIRALI HOODBHOY

Born	:	July 11, 1950 Karachi, Pakistan
Residence	:	Pakistan
Nationality	:	Pakistani
Field	:	Nuclear Physics
Institutions	:	Quaid-e-Azam University
Notable Prizes	:	UNESCO Kalinga Prize (2003), Fulbright Award (1998-99) Abdus Salam Prize for Mathematics (1984)

PROFILE: Pervez Amirali Hoodbhoy is chairman and professor of physics at Quaid-e-Azam University, Islamabad where has taught for over 34 years. He holds a Ph.D in nuclear physics from the Massachusetts Institute of Technology and is the recipient of the Abdus Salam Prize for Mathematics, the Baker Award for Electronics, Faiz Ahmad Faiz Prize for contributions to education in Pakistan, and the UNESCO 2003 Kalinga Prize for the popularization of science. He is visiting professor at MIT, Carnegie Mellon University, the University of Maryland, Stanford Linear Accelerator, and often lectures at US and European universities and research laboratories.

Dr Hoodbhoy is involved in social issues as well, such as : women's rights, environment, education, and nuclear disarmament. He is author of "Islam and Science: Religious Orthodoxy and the Battle for Rationality", now in seven languages. He is chairman of Mashal Books, a non-profit organization based in Lahore that publishes books in Urdu on social, philosophical, and scientific issues. In 2003, Dr. Hoodbhoy was invited to the Pugwash Council, and he is a sponsor of The Bulletin of the Atomic Scientists. He is frequently invited to comment on nuclear and political matters in Pakistani and international media. Over the years, he has produced and directed several documentary films that have been widely viewed on national television which deal with political, nuclear and scientific matters.

Birth : July 11, 1950, Karachi, Pakistan

Permanent Position : Professor, Department of Physics, Quaid-e-Azam University, Islamabad 45320, Pakistan

Phone : 51-2829914 & 51-2829472 (off), 51-2824257 (home), 51-2824257 (fax)

Emails : hoodbhoy@isb.pol.com.pk, hoodbhoy@pierre.mit.edu

Marital Status : Married, two daughters

Education :

B.S. (Mathematics)	Mass. Inst. of Technology (1973)
B.S. (Electrical Engineering)	Mass. Inst. of Technology (1973)
M.S. (Solid State Physics)	Mass. Inst. of Technology (1973)
Ph.D (Nuclear Physics)	Mass. Inst. of Technology (1978)

Research Interests : Quantum chromodynamics, hard processes, spin phenomena, supersymmetry, quark effects in nuclei, conformal field theory, topology and quantum mechanics.

Additional Work Experiences :

1. Technician, Particle Optics Laboratory, M.I.T (1971)
2. Electronics Design Engineer, General Radio Corporation, Massachusetts (1972).
3. Teaching Assistant, M.I.T (1975-1978).
4. Post Doctoral Fellow, University of Washington, Seattle (1981-1983).
5. Visiting Professor Carnegie-Mellon University (1985-1986).
6. Guest Scientist, ICTP, Trieste (1986-present).
7. Visiting Scientist, M.I.T. (1988-1996).
8. Visiting Professor, University of Maryland (1997-present).

Other Positions and Responsibilities :

1. Visiting Research Scientist at Massachusetts Institute of Technology and University of Maryland.
2. Chairman of Mashal, a non-profit organization for the publication of books on modern thought in the Urdu language.
3. Referee for Physical Review Letters and Physical Review D, publications of the American Physical Society.
4. Occasional consultant to the World Bank on secondary education reform in Pakistan.
5. Member of editorial board of INESAP (International Engineers and Scientists Against Nuclear Proliferation) Bulletin, published from Darmstadt, Germany.

6. Local organizer of regional summer school series on arms control, technology, and peace initiatives on the Indo-Pak subcontinent.
7. Initiator and co-director of World Laboratory Project on Cosmology and High Energy Physics in Pakistan, 1988-1990.
8. Member of Educational Advisory Board, Government of Pakistan, 1999-2000.
9. Chairman, Academic Council, Textile Institute of Pakistan.
10. Member of governing board, Sustainable Development Policy Institute, Islamabad.
11. Member of governing board, Indus Valley School of Art and Architecture, Karachi.
12. Member of governing board, Development in Literacy, Islamabad.
13. Council of Sponsors , The Bulletin of the Atomic Scientists

Awards :

1. Baker Award for Electronics, British Association of Electronics and Radio Engineers (1968).
2. Student-of-the-Year, Pakistan Students Association of America (1972).
3. Rockefeller Mauze Fellowship for graduate studies (1973).
4. Abdus Salam Award for Mathematics (1984).
5. Associate of the International Centre for Theoretical Physics (1986-1994).
6. Faiz Ahmed Faiz Award, awarded for contributions towards the cause of education in Pakistan (1990).
7. Recipient of “Book of the Year Award”, awarded by the National Book Council of Pakistan in 1993.
8. Recipient of Fulbright Award (1997-1998) to support one year of research at the University of Maryland.
9. Recipient of the Selma V. Forkosch Award in 2003 from the Council for Secular Humanism

Books Published :

1. Islam & Science : Religious Orthodoxy and the Battle for Rationality, published by ZED Books, London, in 1991 with translations in Turkish, Malaysian, Indonesian, Arabic, and Urdu.
2. Proceedings of School on Fundamental Physics and Cosmology, co-edited with A.Ali, World Scientific, Singapore, 1991.
3. Education And The State- Fifty Years of Pakistan, Oxford University Press, 1998.

Television Documentaries Produced and Directed

1. Produced and anchored a 13-part television series, *Rastay Ilm Kay,* broadcast weekly in 1988 by Pakistan Television comprehensively reviewing the problems of education in Pakistan.
2. Produced and anchored a series of 6 popular programs, *Bazm-e-Kainat,* broadcast by Pakistan Television in 1994, which sought to demonstrate the power of scientific thinking and new scientific insights into nature.
3. Produced and anchored a series of 13 popular programs, *Asrar-e-Jehan* (Mysteries of the Universe) for Pakistan Television in 2001.
4. Produced and directed "Pakistan and India under the Nuclear Shadow", an anti-nuclear 30 minute video.

Newspaper Articles On Social and Political Issues

Approximately 120. Published in Pakistan (Dawn, The News, Frontier Post, Muslim, Newsline, Herald, Jang) and overseas (Los Angeles Times, Le Monde, Japan Times, Washington Post, Open Democracy, Prospect Magazine, Asahi, Seattle Times, Post-Intelligencer, Frontline, The Hindu, Tech, Thursday)

Articles, Lectures, Speeches, Chapters Published in Books, Workshops Organized on Peace Issues and Nuclear Weapons – not listed in this resume

Invited Talks, Colloquia, and Seminars In Physics

1. Centre for Theoretical Physics, Massachussetts Institute of Technology.
2. University of Maryland
3. Brookhaven National Laboratory, New York
4. JeffersonLaboratory, Virginia
5. Los Alamos National Laboratory, New Mexico
6. Syracuse University
7. University of Rochester
8. University of Chicago

9. Bartol Research Institute, Delaware
10. Indiana University, Bloomington
11. Centre for European Nuclear Research (CERN, Geneva)
12. Davidson College, North Carolina
13. Institute for Nuclear Theory, Seattle.
14. American Physical Society, Washington DC.
15. DESY, Hamburg
16. International Centre for Theoretical Physics, Trieste
17. Particles and Nuclei Conference (PANIC, Perugia)
18. The Free University (Amsterdam, Holland)
19. Osaka University, Japan
20. Tata Institute for Fundamental Research, Bombay

Source : http://www.unesco.org/pao/hoodbhoy.htm

Pakistan needs an education system that develops humanism, enlightenment & critical thinking in its children not jingoism.

Physicist & Peace Activitst Dr. Pervez Amirali Hoodbhoy

Secularism does not mean abandoning religion. In Europe there exist many religion but their followers live as equal citizens. There is no other way to take a nation forward than path of secularism & scientific thinking. .

... Dr Pervez Amirali Hoodbhoy

Kalinga Laureate for Popularization of Science - 2004

Professor Jean Audouze, France

[Born : 13th November, 1940, Cahors (France) …]

Great Astronomer Hubert Reeves taught me a great deal and, in particular, that research does not necessarily consist of doing calculations but of asking the right questions. He also made me aware of the Anglo-sexon approach where one does not tackle axiomatic & complex problems for the sheer pleasure of it. So I set about looking for the simplest paths to explore. If it is simple, then I can do it. This has influenced me in my way of working.

… Jean Audouze

CURRICULUM VITAE FOR JEAN AUDOUZE

Birth : Born on 13th November 1940 at Cahors (France)

Present Position : Directeur de recherché de classe exceptionnelle au CNRS

Professional Address :

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Personal Address : 8 Avenue Adrien Hébrard, 75016 Paris

Marital Status : Married

Education :

Ecole Normale Supérieure	1961-1965
Docteur de 3ème cycle en Astrophysique (Paris University)	1964
Docteur en Sciences Physiques (Paris University)	1970

Positions held :

- Eléve fonctionnaire, Ecole Normale Supérieure, 1/10/1961-30/09/1965
- Stagiaire de recherché au CNRS, 1/10/1965 – 30/09/1966
- Attaché de recherché au CNRS, 1/10/1966 – 31/01/1970
- Chargé de recherché au CNRS, 1/02/1970 – 31/12/1974
- Research fellow in physics, California Institute of Technology (Pasadena USA), 1/10/1970 – 1/5/1973
- Ma-tre de conférences de physique á I' Ecole Phlytechnique (lecturer in astrophysics) 1/10/1974-30/9/1989
- Ma-tre de recherché au CNRS, 1/10/1975 – 31/12/1980

- Visiting professor of Physics – Mc Donnell Space Flight Center
- (Washington University, St-louis-USA), April-May 1975, May 1976
- Director of the Institute d' Astrophysique de Paris (CNRS)- personal : 100 people (60 researchers – 40 Technical staff), 1/2/1978-20/12/1989.
- Member of the Board of the Canada France Hawai Telescope Corporation from 1980 to 1989, Chairman of the Board in 1986 and 1987.
- Directeur de recherché (1ére classe) au CNRS, 1/01/1981 – 31/12/1994
- Founder of the series of Moriond meetings in astrophysics on February 1981 and organizer of these meetings from 1981 to 1986.
- Research Associate of Physics California Institute of Technology Pasadena, October and November 1982.
- Visiting professor of astrophysics, UCLA, Los Angeles, USA – Falls 1983, 1984, 1985, January 1989, August 1989, April 1998.
- Member of the Scientific Committee of the Space Telescope Science Institute (Baltimore), 1984-1986.
- Scientific editor Editions Belford, 1984-1989.
- President of commission "Cosmology" belonging to the International Astronomical Union, 1985-1988.
- Chairman of the Space Telescope Advisory Team of ESA, 1985 -1987.
- President of the Societé Francaise des specialists en Astronomie, 1986-1987.
- Miller visiting professor of astrophysics, University of California, Berkeley, October – November 1986.
- Conseiller technique á la Présidence de la République charge de la Recherche, la Technologie, I' Espace et I' Environnement, 26/1/1989-5/2/1993
- Ma-tre de conferences (Institute des Sciences Politiques de Paris) since 1/10/1990.
- President of the Etablissement Public du Parc et de la grande Halle de la Villette, 5/2/1993 – 5/2/1996.
- Directeur de recherché, classe exceptionnelle 1re 2eechelon since 1/10/1999
- Vice-President of the Unesco French National Commission, Since 2000.

- Chairman of the panel "Future of the French nuclear weapon systems' (Ministory of Defense), 2000.
- Editor of New Astronomy Reviews Elsevier), Since 2000.
- Chairman on the Local Organizing Committee of the General Assembly of COSPAR (July 2002-July 2004).
- Member of "Haut Conseil d' Evaluation de I' Ecole" since 2004

Research Activities :

They concern nuclear astrophysics, i.e. the application of nuclear physics and particulars physics to astrophysics. I am the author of about 200 scientific publications on these themes. Among the specific topics, let me quote.

- Member of "Haut Conseil d' Evaluation de I' Ecole" since 2004
- The light element (lithium, beryllium and bore) formation by interaction between cosmic rays and interstellar medium (our work of 1971 is the most important reference in that domain).
- The effects of spoliation reactions, which could occur at the surface of stars or inside meteorites.
- The explosive nucleosynthesis which takes place inside novi and supernovi.
- Nucleo- cosmo- chronologies deduced from long lived radioisotopes produced by s, p and r nucleosynthetic processes.
- After my first stay in the USA, I have founded in France a research team who took the lead on chemical evolution of galaxies. My review paper in 1976 with BM Tinsley is also a basic reference concerning this topic.
- Primordial nucleosynthesis which is predicted by the Big Bang theoris and which allows to describe this conmological scenarios with significant accuracy. As a follow up of that subject, I have played a major role in France in establishing useful collaboration between particles and nuclear physicists and astrophysicists.
- Presently, I am interested in the recent progress in gamma ray astronomy and expect to contribute in the interpretation of the gamma ray spectra obtained by the space mission INTEGRAL.

I have been the thesis advisor of around twelve researches students whom L. Vigroux, head of CEA who will become in 2005 the director of the Instituted

Astrophysique de Paris, B. lazareff, astronomer (Observatoire de Grenoble), deputy director (Institut de Radio Astronomique Millimétrique), J.P. Chiéze, P. Delbourgo-Salvador, G. Malinie and R. Lehoucq, physicists (EA), E. Vangioni-Flam, research engineer (CNRS), B. Zanda, Ma-tre de conference (Museéum National d' Histoire Naturelle), I. Baraffe, astronomer (Observatoire de Lyon)…

I have founded the series of astrophysical Moriond meeting en 1981 and I have organized nad published the proceedings of about twenty schools or international meetings.

Space Related Activities :

During the 1970 years, I have served in the committee << Astronomie et Systéme Solaire>> of Centre National d' Etudes Spatiales (C.N.E.S.). At the same period, I was a member of the Scientific Program Committee which has the task to select the french space missions. In the summer of 1961 was one of the lecturers of the summer school organized by CNES regarding the current progresses in Space Astronomy. During the 1980 years, I was one of the two European members of the scientific committee of the Space Telescope appointed by R. Giacconi, the first director of the Space Telescope Science Institute in Baltimore. This scientific advisory committee set up the program selection procedures, such as the concept of key projects. At the same period, I was appointed chairman of the Space Telescope Advisory Team of the European Space Agency (ESA). This team prepared the scientific guidelines of the ESA Space Telescope facility, which was established in Garching within the ESO organization. Moreover it selected the European proposals to use the guaranteed time allocated to the group responsible for the realization of the Faint Object Camera. From 1989 to 1993, I was the scientific advisor of president F. Mitterrand and was his advisor for the space affairs. In 1996, CNES requested my participation in the definition and building of its Strategic Plan. In July 1996, I was appointed as the French representative in the council of COSPAR. I have been elected as a member of the bureau of COSPAR in 1998. I pursue currently my mandate in these two capacities. In 1999, the World Committee on Ethics of science and technology, belonging to Unesco asked me to participate to the working group on ethics of space. I am presently the chairman of the Local Organizing Committee of the Paris Cospar General Assembly, which will take place on July 2004.

Research Administration and Other Responsibilities :

During twelve years (1978-1989), I have been the director of the Institute d' Astrophysique de Paris, the most prestigious research laboratory in astrophysics in France and I believe that I have rejuvenated this place and made it internationally visible.

From 1989 to 1993 I have been the scientific advisor of President Francois Mitterrand, responsible of Science, Technology, Environment and Spatial Affairs.

From 1993 to 1996 I have been the first president of the Etablissement Public du Parc et de la Grande Halle de la Villettee which is responsible of the cultural animation of a huge urban complex in the North of Paris.

From 1998 to 2004 I have been the director of Palais de la dícouverte (personal of 250 people), a great and reputed scientific museum located in the very center of Paris.

Since march 2004 I chair the scientific committee of the Salon de la Recherché et de I' Innovation", the first edition taking place in paris on June 2005.

I have had and / or have responsibilities at the international level :

- Member of the board of the Canada-France-Hawaï Telescope corporation from 1980 to 1989 and chairman of the board on 1986 and 1987.
- Mem ber of the Fachbeirat of the Max Plank Institute für Astrophysik (Garching) from 1984 to 1996 and chairman from 1990 to 1996.
- Member of the scientific committee of the Space Telescope Science Institute (Baltimore), 1984-1986
- Chairman of the Space Telescope Advisory Team of ESA, 1985-1987.
- Chairman of the Commission "Cosmology" of IAU, 1985-1988.
- Member of the Cospar council since 1996 and member of its bureau since 1988, Chairman of the local organizing committee of the Cospar General Assembly, 2004.
- Rapporteur of the theme "Ethics of Energy" for the COMEST (World Commission of Ethics of Science and Technology) of Unesco since 1996.
- Vice-President of the French national Commission of Unesco since 2000.
- Author of report concerning the future of the French nuclear defense weapon system at the attention of the Ministry of Défense. At the national level, I have held many positions in various consulting committees of CNRS-CMES-ESA and further scientific associations.

Teaching and Popularization of Science :

- I have taught astrophysics and space physics from 1974 to 1989 at Ecole Polytechnique. I teach a general course on science at the master level at Science Po since 1990.
- I have taught these topics in several foreign universities and summer

schools (Caltech, UCLA, Berkeley, University of Virginia, Washington University…)

- I have published about ten popular and text books among which Nuclear Astrophysics (Reidel) and the Cambridge Atlas of Astronomy…
- As written earlier, I have been the director of one of the largest scientific museums in France for more than five years.

Honors :

- Chevalier de la Légion d' Honneur 1989
- Officer de l' Ordre National du Mérite 1996.

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"To Reconcile Science and the Culture"
Interview with Prof. Jean Audouze:
by

Philippe Misischi
pmisischi@yahoo.com

To astrophysician of reputation, in turn Directing of the Institute of Astronomy, scientific Adviser of the President of the French Republic, for then being in load of the direction of the Park of the Villette, Jean Audouze, is, currently, Directeur of the Palate of the Discovery. At the time of its visit in Istanbul, it presented at the French Institute a conference" a Short History of the Universe". Not forgetting its past of teacher, it came to the meeting from the students. Available, simple and accessible, Jean Audouze announced his reflexion to us concerning the world of Science.

According to you, which is the utility of science?

Science is used only for the pleasure of the knowledge. Research, it is to be posed and try to define questions to which one hopes to have means of answer. And then, happily, one answers it! It is useful as much than to go to see works of art, mosaics, frescos…You make it because you estimate that you must do it. It is useful, because, perhaps, you will find the inspiration there. Fortunately the life is not linear. I do not work towards an end, I walk, I butine. It is necessary to keep with the human life its unforeseeable side. The step of the researcher must be an open step which does not exclude the occasions. The scientist must remain open. The utility does not justify the scientific step. Why is a foreign language studied? Because one wants to know another language. Is this useful? I do not like much because one does not know what is useful; it is never known.

Is astronomy known general public?

I consider that, among sciences, astronomy is relatively well-known compared to the other disciplines. With each launching of rocket, the newspapers speak about it. The first vehicle which moved on the surface of Mars was entitled to the first pages of the newspapers.

Is scientific research connected with a intellectual play?

Any research begin with a question or a problem. Of a problem with another , the researcher continues to answer the questions which feed its research. Little by little, I decided to apply my method on other subjects. I was interested in the universe following questions which arised. Of course, I did it because I had the tools which enabled me to continue my research . Research is a advance which does not decide a priori. It is what is amusing.

Which is the way which leads to astrophysics?

There is not only one way, there are several of them. There is that of the call; that of the child who wants to make this trade, for various reasons-way of which about a half of the professional astronomers comes. We are approximately 800 in France and between 5000 and 6000 in the world. I belong to other half of people who at twenty years study physics and which ask for then which physical kind of choose. Randomly meetings, I started to study astronomy because, for me, it was a way interesting to make physics. I began astronomy at the beginning of my control. In the Sixties, it was that Hubert Reeeves came to France, at one time when it was not known of the public. He became my reader. This moment, I was interested in stars and their energy. For me, the stars were beautiful laboratories where strong nuclear reactions were observed. I was intrigued by these places of the sky where heat was significant. I then put myself the following questions: “That can we discover of the universe in these places?”, “That does it occur?”, “How do they evolve/move?”. I, immediately, did not put myself the questions: “From which we come?”, “Where do we go?”… It came, well afterwards.

And thus little by little you were interested in the history of the universe?

I was interested there as from years 70-80, because that was thus. Because the elements which I studied, i.e. the heavy isotope of hydrogen – deuterium – had cosmological implications. With Hubert Reeves, we realized indeed, that there were ten times less deuterium, relating to hydrogen, in the interstellar environment that on ground. What did that mean? Thus I came naturally to cosmology; i.e. with the study of the universe as a whole; astronomy, as for it, is the study of stars.

If you must retain only one discovered, which would be it?

I do not like to say “the” discovery. There are”” discoveries . But for me, the fact of being able to write scenarios, which describe the history of the ;universe, and founded, while trying to compare observations and to be, then, able to make predications as for the origin of the universe…That, yes! It is a great discovery!

After having directed the Institute of Astronomy of 1978 to 1989, you were to advise of the President of the French Republic. Which was your role?

My role, in the field which was mine, i.e. seeks it, space and the environment, consisted in informing the President on the topicality then to deliver a scientific opinion to him. My function was to comment on the proposals made at the Council of Ministers to him. I was a provider of information and opinion. It is interesting but it should not be done too a long time. I did not have time to look further into the subjects.

Then, you became director of scientific

It is different and quite as interesting; you have a public which you must satisfy. The museum is a company where you have two hundred people with different trades. It is necessary to make them work together so that the public is content, so that the place is accessible and so that there are interesting activities.

Thus, you knew the scientific world under various aspects.

Indeed, I known it under four aspects: research, teaching, the policy and direction of museums. The scientific world is interesting under all its aspects.

Which is your vision of the scientific popularization?

Popularization is necessary. I think that it is well to be interested in science in several ways. It is like all! There is the maid and bad popularization, in the same way that there are goods and bad teachers, good s and bad researchers or goods and bad politicians. It is not the activity in itself which is good or bad. Popularization is necessary and nothing is to be excluded: book, re-examined, radio, television, exposures…

And now, according to you, which is the role of the scientist?

At the XIXe century, one obviously sought to isolate and to magnifier the scientist. One put it in the laboratory by specializing it. It is sure that it was excluded from the world. For my part, I want to make it return in the world so that he is a man like the others, that he shares his knowledge and that he makes it appreciae with the others. Since a score of years, the things evolved/ moved ad precisely Hubert Reeves arrived at one moment when few scientists were interested in the publication. There is now a will of the scientists to go towards people even if science still rejects some. The task is not finished yet, a certain repulsion is to be overcome. It is true that an effort should be provided but this effort is required to be a citizen conscious of world which surrounds it. The culture like science, it is much of things. It is to speak with you, it is to buy a newspaper, it is to belong to the life. Science is not reserved for an elite, with people who have a certain qualification. Science belongs to everyone. Science is in the life, it is everywhere. This interest transmits seems me to be, for the moment, which I have to do.

- "I have rarely been a candidate for anything, Rather, I have accosted offers that have come my way. I am a little like a traveler, looking at the signposts and thinking, well yes, I think I will go down that road….."
- Research, Museums, Politics Teaching…. If he had to dedicate his life to just one of these fields, which would he choose ? If I had had to take just one path I would not have been happy. But I suppose I could have been solely a researcher.

... Jean Audouze

Kalinga Laureate for Popularization of Science – 2005

Professor Dr. Jeter Jorge Bertoletti , Brazil

[Birth : 11th January, 1939, Caxias do Sul / RS, Brazil …]

- **The biggest discovery is the one we make**
- **Approaching People, Science & Technology focusing in a fuller comprehension of reality is the Mission of my Museum.**

…Dr Jeter Jorge Bertoletti

Summary of Jeter Jorge Bertoletti's Activities

PERSONAL DATA

Date of Birth	:	11.01.1939
City of Birth	:	Caxias do Sul / RS, Brazil
Marital Status	:	Married with Ana Clair Bertoletti, with whom has three daughters
Profession	:	Teacher Biologist Reg. At CFB nro.: 00660/84 Museologist Reg. At COREM/RS nro.: 0034/86
ID Nro.	:	1002441861
CPF Nro.	:	002607110/04
Elector Nro.	:	92.562/A-1ª Zone
Director Registration	:	6146
Teacher Registration	:	F 21060
Private Address	:	Rua Sinke, 236 – casa 47 – Phone #: (+55) 51 / 3233-6558 CEP : 90840 – 150-Porto Alegre/ RS, Brazil
Work Address	:	Av. Ipiranga, 6681- Prédio 40 Fone : (+55) 51 3320-3521 Zip code : 90619-900-Porto Alegre/RS, Brazil e-mail: jeter@pucrs.br

- Graduated in Natural History by the Pontific Catholic University of Rio Grande do Sul (PUCRS) as Bachelor in 1962 and Licensed in 1963, professor Jeter Jorge Bertoletti has a Phd degree in Natural History and is a Free Professor in Biological Geography by the same University, since 1977.
- As teacher at PUCRS since 1961, he developed in these 46 years, 33 special activities in the Institution, at the State Secretary of Education and at the State Secretary of Agriculture in the State of Rio Grande do Sul. With 151 papers published in periodicals, magazines and annals, besides 106 technical papers, professor Jeter advised 163 undergraduate and graduate scholarship students from Ford Foundation, PUCRS, National Council for the development of Science and Technology (CNPq), HumanResources Preparation Program for Strategic Activities (RHAE) of the Ministry of Science and Technology, Coordination for the Improvement of Higher level Personnel (CAPES) and Foundation for Support to Research of Rio Grande do Sul (FAPERGS). He has been also advising consultant for 55 natioal and international Environmental projects (Environmental Impacts

Assenments – EIAs – Environmental Impacts Reports – RIMAs – and others, working for companies like Consórcio Nacional de Engenheiros Consultores (CNEC), Hidroservice Engenharia Ltda. Sondotécnica Engenharia de Sols S.A., Comisión de Estudios para el Desarrollo de la Cuenca del Río Guayas (CEDEGÊ), Empresa HIDRENED – Argentine, Eletrosul Centrais Elétricas S.A. e Companhia Estadual de Energia Elétrica (CEEE).

- He planned and implemented 19 projects for the Government of Rio Grande do Sul, in partnership between PUCRS and FAPERGS, aiming at dissemination of science and to the memory of technological production in fishing, specially directed to fishing communities with economical difficulties, as in the "Tainha project", "Shrimp project" and "Professional preparation for fishers and technicians", developed in Rio Grande and Tramandaí, among others.
- He is author, organizer and founder of the Science and Technology Museum of PUCRS (MCT), opened at the forth of July of 1967. Under his direction, in 40 years, the museum was improved continuously, increasing significantly its exhibition area. The new Museum opened in 1998.
- Pioner in its branch of activities, the new Museum (MCT) is the largest Interactive Science Center of South America, distributed in a five store building with and area of twenty-two thousand square meters. The Museum's structure gathers scientific and didactic collections, with around five million items, twelve modern scientific laboratories for research and five special laboratories for formation and continuous education of teachers. Its exhibition area, with 12.500 square meters, is integrated by 23 thematic areas, besides a Computer Club, Arts Space, Room for Multi-activities, with capacity for 3D projection, approximately 700 interactive exhibits, that offer to the visitors a playful, easy and dynamic learning, representing an important tool for rising curiosity and interest in science for children, young and adults, besides permitting to complement school studies for students in different school levels. The direction given by Bertoletti has always been toward popularization of scientific and technological knowledge, making from this, a tool for social inclusion of the population.
- In the last five years the Museum attended 2.427.950 visitors, with an average of 1.611 visitors per day.
- In 1991, Bertoletti produced and implemented the Pro-Mata, in São Francisco de Paula, RS. The project consists of a Conservation Unit directed to research and conservation of nature. Today with 4.500 ha, it presents a diversity of ecosystems with great number of flora and fauna specimens under extinction.
- In 2001, professor Jeter created and implemented two other projects with great social and educational value, coordinating them till today. The Project of ltinerary Museum (PROMUSIT) and the Project of School- Science (PROESC).
- The PROMUSIT is constituted by a microbus for transporting teachers, researchers, technicians and undergraduate students; a van with equipment and maintenance personnel; and a truck that transports 70 exhibits and dozens of pedagogical kits, organizing in a minimal area of 800m^2. When unloaded, the truck becomes a modern multi-activities studio, with varied equipment, microscopes, computers, 3D projection, among others.
- Until December 2006, PROMUSIT attended 1.644.459 persons, in its majority students and teachers, in 84 events, giving free access to an interactive teaching approach toe science from MCT, without having to leave their cities.

- The PROESC, by its turn, consists of a bus specially equipped, that transports to the MCT groups of deprived students, children with special needs and students from dangerous areas. The students reached by this project get the transportation to the museum, besides free entrance to the exhibition area, and for many of them also lunch.
- Until December 2006, the PROESC had attended 174 counties, 903 schools, 48.252 students and teachers and 9.251 lunches.
- Bertoletti, besides planning and implementing all the Museum Laboratoriesf, has also created a Special Scientific Library, which has more than 40.000 items, being half of it on the Aleph system. This collection had its origin on interchange with other institutions of periodicals of the MCT, Scientific Communications and Divulgations of the Museum of Science and Technology, created by Bertoletti.
- For a broader evaluation of Professor Bertoletti's contribution to science and technology, are send with this document a CD and an examplar of the periodical Divulgations of the Science and Technology Museum, number 5. From page 21 to 82 is presented part of the story of professor's work. The MCT Museum is today a reference at the national and international level inpopularization of science and in social inclusion, serving as an example to other science centers and museums in Brazil. Much of this, without doubt, is due to the work done in more than 40 years by professor Jeter Jorge Bertoletti.

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Prof. Jeter Jorge Bertoletti's Response on Receipt of UNESCO Kalinga Prize

Acceptance Speech

Dated 10th November, 2005

Dear friends :

Today I feel especially touched. This Kalinga award is a confirmation that it is worthwhile to dream and to work hard daily to fulfill a dream.

This dream goes back fifty years, started with the first piece of my first scientific collection: the dream of creating in Brazil a dynamic way of popularizing science, with an effective participation of the student in the learning process.

With persistence and obstinacy, refusing dozens of financially more attractive occupations, this dream, gradually, became reality with my work at the Pontific Catholic University of Rio Grande do Sul – Institution that, even having less than 60 years of existence, appears already among the largest in South America-which culminated with the creation of the Science and Technology Museum, built for raising the visitors curiosity and interest in relationship to science and technology, joining learning and playing in interactive exhibits.

Inthis context, it was a great pleasure to be able to contribute with hundreds of student orientations, publications, counseling and with the implantation of innumerous projects, aiming to promote better conditions and life quality for the population.

I assure you that I will continue to work and dream with the eradication of scientific illiterateness in my country, and, why not, of the whole planet, with the promotion of human development.

I am very grateful to Laszlo Sólyonm, the Hungarian president, to E. Sylvester Vizi, the Hungarian Science Academy president and especially to Kochiro Matsuura, the UNESCO General Director, and his staff, in the name of Yoslan Nur.

I am also very thankful to the Brazilian Government support, represented by the person of the Ministery Edurardo Campos, the support of the Brazilian Science Adademy, of the Brazilian Society for the improvement of Science, and of Vitae- support to culture, Education and Social promotion and of innumerous Brazilian and foreign institutions, besides the engineer Luiz Alexandre Schuch, who started the process of my indication to this award, and to my wife Ana, which was always at my side.

At last I would like to make a very especial thank to Bijoyanand Potnaik, Founder and President of the Kalinga Foundation Trust in India for his engagement with the popularization of Science at the world level.

Thank you all.

Prof. Dr. Jeter Jorge Bertoletti

Main Goals of my Museum are

- Awake and develop scientific and technological spirit of the main population.
- Popularizare science and technology through the cientifical education, in a process of social inclusion through the learning system developed in MCT. [Musum of Sc. & Tech]
- Contribute to the improving of formal and informal education of Sciences and Mathematics.
- Contribute to the improving of teachers education
- Enable technicians, specialists and researchers.
- Produce educational materials and programmes.
- Establish exchange with similar institutions.
- Improve the basic and applied cientifical research.

…Dr Jeter Jorge Bertoletti

UNESCO Kalinga Laureate for Popularization of Science - 2009

Professor Yash Pal, India

[Birth : 26th November, 1926...]

PERSONAL DATA

Prof. Yash Pal

Born : **26th November 1926**

Education : After completing post-graduation in Physics at Punjab University in 1949, joined the Tata Institute of Fundamental Research. **In** 1958 obtained Ph.D. Degree in Physics from the Massachusetts Institute of Technology.

Professional Positions :

- Chairman, University Grants Commission (1986-91)
- Visiting Professor at the Neils Bohr Institute Copenhagen, University of Maryland, California Institute ofTechnology, Danish Space Research Institute.
- Chairman, University Grants Commission (1986-91)
- Secretary, Department of Science & Technology (1984-86)
- Chief Consultant, Planning Commission (1983-84)
- Secretary General, of the 2nd United National Conference on Peaceful Uses of Outer Space (1981-82)
- Distinguished Scientist, Indian Space Research Organisation (1980-83) Director, Space Applications Centre, Ahmedabad (1973-81)
- Professor, Tata Institute of Fundamental Research (upto 1983)
- National Research Professor (1995-)
- Jawaharlal Nehru Chair in Technology, Punjab University (1997-1999) The first Chair of the Modern School, New Delhi
- Is/has been Chairman/Member of various National and International Committees, Boards and Organisations, and on the editorial boards of scientific journals.
- Chairman, National Institute of Design (1984-91).
- Member, UN Advisory Committee on Science and Technology for Development (UNACSTD).
- Member Scientific Council, International Centre for Tehoretical Physics (ICTP). Chairman, National Council of Science Museums.

- Chairman, Sky Art Conference, Linz, Austria in 1982.
- President, Indian Physics Association.
- General President, Indian Science Congress (1989-90)
- Vice President, International Union of Pure and Applied Physics (IUPAP) Member, United Nations University (UNU) Working Group for World Institute for Space and Society
- Member UNESCO Study group on Future of Universities
- Chairman of the National Advisory Committee report "Learning without Burden" Chairman, Governing Board,INFLIBNET
- Member, Governing Council, Giri Institute of Development Studies (Lucknow) Chairman, Project Board, Hanle Telescope Project of IIA
- Chairman, Project Board UVIT project of ASTROSAT

Some Current Responsbilities :

- President, NCSTC Network
- Member, Council of Centre for Rural And Industrial Development (Chandigarh) Trustee: Indira Gandhi Memorial Trust (till 1997)
- Indira Gandhi National Centre for the Arts
- Member, Governing Council, Indian Institute of Astrophysics (IIA)
- Member: Organising Committee of Indira Gandhi Conferences on World Affairs
- Founding Member: Steering Committee for the Project on the "History of Indian Philosophy Science and Culture
- Founding member, Centre for Study of Civilisations.
- Advisory Committee for selecting Marconi Fellows, Marconi Foundation (upto 2004)

Area of Work : Fields of Cosmic Rays; High Energy Physics, Astrophysics; Science Educaito; Space Technology; Communication and Development; Education.

Honours and Awards :

- In 1976 Awarded Padma Bhushan by the Government of India for contribution to Science and Space Technology
- In 1980 the Marconi International Fellowship Award "to recognise wise and humane leadership in applying modern communications technology to meet the needs of isolated rural

villagers in India" (Highest International Award in Communication).

- In 1989 received 5th Annual Award of the Association of Space Explorers (the first award was given to Jacques Yves Cousteau) in recognisation of best effort. in bringing the benefits of space research home to earth.
- In 1989 Shiromani Award for achievements in the Chosen fields of activity.
- In 1984 Dayanand Saraswati Centenary Gold Medal for Excewllence in Science.
- G.P. Chatterjee Memorial Award (1987) of Indian Science Congress.
- Zahee Memorial Lecture Award (1987) at the Indian Science Congress.
- First Lord Perry Award for Excellence in Distance Education (1992)
- Aurther C.Clarke Award for Communication and Space Technology (1994).
- The Asiatic Society's Sir William Jones Memorial Gold Medal (1996).
- Indian National Science Academy Award for Science Popularisation.
- NCSTC Award for Best Effort in Science Popularisation (2,000)
- Asutosh Mukerji Award of the Indian Science Congress
- CEC (Centre for Educational Communication) Award for Educational Communication

Fellowship/ : Fellow :

Indian National Science Academy.

Membership etc. : Indian Academy of Sciences; National Academy of Science; Indian National Academhy of Engineering, International Academy of Astronautics; National Fellow of the National Institute of Education

Foreign Member : American Academy of Arts and Sciences.

Honorary Fellow : Inter University Centre for Astronomy and Astrophysics; Indian Society of Astronautics; Computer Society of India; Institute of Electrical and Telecommunication Engineers (IETE).

Honourary Degrees : Has been awarded honourary degrees of Doctor of Science by the number of Univesities.

Publications :

- Has made significant contributions over the years in the areas of cosmicrarys, high energy physics, astrophysics, science education, communication and development and has published a large number of papers in national and international journals. Some of his scientific work let to:
- Discovery of negative K-meson
- The first observaitons of Pair-production of elementary particles;
- Understanding the role of cosmic & cosmic-ray neutrinos;
- Prediction of rise in the p-p cross-section;
- Recognition of importance of excited states of particles in multiple meson production at high energies;
- First development of the leaky-box model of cosmic ray propagation in the galaxy, and
- Cosmic-ray phenomenology including fluxes of various particles in the atmosphere and below ground.
- Has done extensive work in the theory and practice of Communication for Development, and has proposed new ways of using modern technology, including space technology, in ways appropriate for developing countires. Has written and spoken extensively on issues of Science and Society, specially on the need for science to form an integral part of human living, not only in terms of providing tools and techniques for doing things but also to influence human values, ethics and consciousness.

Media Activities :

- Chairman: Advisory Committee of TV series
- "BHARAT KI CHAAP", "TUR-RUM-TU", "RACE TO SAVE THE PLANET'. Solar Eclipse program; Comet programmes; Venus Transit.
- Advisor, including script correction and approval, answers to questions, for the Science Magazine T.V. Series (over 150 episodes) "TURNING POINT'.
- Answering questions on Internet and Chat sessions on Internet formo years. Weekly column in several newspapers answering questions from children and general public under titles "Understanding the Universe with Prof. yash Pal" and "Your

Discovered Questions", this Universe".

- This engagement has made him declare, "we should learn from children what to teach them".
- Large number of other programes on T.V. and Radio.

Institution Building :

- Responsible for Conceptualisation and'or Establishment or Development of the following Institutions including Inter University Centres (IUCs):
- Space Applications Centre, Ahmedabad;

  {SITE experiment was conducted and development of satellite payloads for Communication, Remote Sensing and Meteorology was initiated during his tenure of eight years as the founding Director of the Centre}.
- Nuclear Science Centre, New Delhi,
- Inter University Centre for Astronomy ,and Astrophysics, (IUCAA), Pune, I.U.C. DAEF (Indore, Calcutta, Mumbai).
- Centre for Educational Communication (CEC) (Countrywide Classroom), including initiation of Video Classrooms Lectures Programme.
- Information and Library Network (INFLIBNET). Ahmedabad
- I.U.C. for Social Science and Humanities, (at Indian Institute of Advanced Studies, Shimla).

General :

- For several years, more since 1995, Professor yash Pal has been interacting with various social, scientific and educational institutions, including schools, colleges, universities and liT's. More often than not it is at the invitationo f students and field activists. He claims to learn a lot form children. Some people have termed him as the Carl Sagan of India. Others have dubbed him as a Gandhian Technologist. He often suggests modern ways of achieving inclusive societies that would moderate and then eliminate the rising tide of ethnic tensions and terrorism. He keeps on stressing that India has to define modernity and development in its own terms.
- Professor Pal was responsible for conceptualizing the "Science is Everywhere" series of television programs for rural children during the SITE experiment (1975-76).
- He was the Chairman of the Committee that produced the report "Learning Without Burden" in 1993.

- Lately (2004-05) he has been involved in formal scholl education as Chairman of the Steering Committee for the National Curriculum Framework - 2005. This effort done through NCERT and a large number of academics in the country might bring a significant change in the way India's children would be educated.

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18th November, 2005.

UNESCO Kalinga Laureate for Popularization of Science – 2009

Professor Trinh X. Thuan, Vietnam

[Born : 20th August, 1948, Hanoi, Vietnam...]

Prof. Trinh X. Thuan
Biographical Profile

Personal Website	:	http://www.trinhxuanthuan.com/
Email	:	txt@virginia.edu
Phone	:	(434) 924-4894
Fax	:	(434) 924-3104
Office	:	253 Astronomy Building
Address	:	Department of Astronomy P.O Box - 400325 Charlottesville, VA 22904-4325

Curriculum Vitae	:	B.S., California Institute of Technology Ph.D., Princeton University Postdoc, California Institute of Technology Presently : Professor, University of Virginia Research Associate at Institute d' Astrophysique de Paris
Research Interests	:	Galaxy Evolution Chemical evolution of the universe Compact blue dwarf galaxies
Recent Research Assistants	:	Former : Michael Fanell (Ph.d., 1991) Ricky Patterson (Ph.D., 1995) Franz Bauer (Ph.D., 2000)
C**ourse Recently Taught**	:	Astronomy 121 Astronomy 124
Publications	:	Link to publications

My Primary research involves studying very young dwarf galaxies in the local universe. These can be used as nearby laboratories for studying galaxy formation processes and for improving the accuracy in the measurements of the primordial Helium abundance to constraion better BIg Bang nucleosynthesis and the amount of baryonic matter int he universe. I plan to develop a new technique to search for these very metal-deficient objects at look-back times of abount 10 billion years (i.e. going back in time 2/3 of the age of the universe). using the new large 10-m class telescopes now beginning to be operaitonal, such as the European VLT (Very Large Telescope) and the American Gemini-Telescope.

Childhood and Studies

Trinh Xuan Thuan was born on 20th August, 1948 in Hanor (Vietnam). He left Hanoi at the age of 6, when Vietnam was divided into two parts at the 17th parallel by the Geneva treaty, signed in 1954. His family then moved to Saigon, capital of South Vietnam. He pursued his studies in Saigon, at the French high school Jean-Jacques Rousseau. It is during that period that he acquired the French style that allowed him to write in French such great popular books on astrophysics and cosmology, that are famous not only for their scientific accuracy, but also for their poetic language. he passes with high honors the baccalaureate degree in 1966.

He then went abroad for his higher education. After one year in Switzerland (1966-1967), at the Ecole Polytechnique in Lausanne, he continued his studies in well-known American universities. He obtained

off Technology (Caltech) in 1970, then his PhD in Astrophysics at Princeton University in 1974, under the guidance of the eminent astrophysicist Lyman Spitzer, father of the Hubble space Telescope and one of the pioneers of the physics of the interstellar medium and of plasmas.

Research and Teaching

Since 1976, he has been a professor of astronomy at the University of Virginia in Charlottesville, and divides his time between the United States and France. As an invited professor at the University of Paris 7, at the observatory of Paris-Meudon, at the department of astrophysics of Saclay and at the lAP (Institute of astrophysics of Paris) of the CNRS, he collaborates regularly with French scientists.

An astrophysicist internationally recognized for his research in extragalactic astronomy (concerning objects beyond the Milky Way), he is the author of more than 230 articles on the formation and evolution of galaxies, in particular of dwarf galaxies, and on the synthesis of light elements in the Big-bang. His articles are widely referred to in the world.

For his astronomical research, he makes use of the largest telescopes on the ground (Kitt Peak, Hawaii, Chile ...) and in space (Hubble, Spitzer ...). At the end of 2004, thanks to observations made with Hubble, he discovered the youngest known galaxy in the universe (I Zwicky 18) - a discoverery that was amply discussed in the international press.

In addition to his research, he teaches a course at the University of Virginia which is called “Astronomy

scientific background have the pleasure of discovering the wonders of the Universe in a non-technical language.

Writings and talks

In addition to his research, he teaches a course at the University of Virginia which is called “Astronomy for Poets”. In this course, students with a nonscientific background have the pleasure of discovering the wonders of the Universe in a non-technical language.

- The Secret Melody (Hardback Version: Oxford University Press, 2001; Paperback Version: Templeton Foundation Press, 2005), a panorama of modern cosmology and its philosophical implications.
- An astrophysicist (written in French, Beauchesne Fayard, 1992, Champs-Flammarion, 1995), an autobiography.
- Birth of the Universe-The Big-bang and after (Discoveries, Abrams, 1993), an illustrated histroy of the Big Bang.
- Chaos and Harmony (Hardback Version: Oxford University Press, 2000; Paperback Version: Templetion Foundation Press,

2006), a synthesis of the perspectives of scientific revolutions in the 20th century and of their philosophical implications.

- The Quantum and the Lotus (Hardback Version : Crow ,2001; Paperback Version: Three Rivers Press, 2004), a dialogue with the Buddhist monk Matthieu Ricard on convergences and divergences of science and of Buddhism in their descriptions of reality.
- Origins, (written in French, Hardback Version, Fayard, Paris, 2003; Paperback Version, FolioGallimard 2005), a coffee-table book, illustrated with splendid photographs of the cosmos, which tells the 14 billion years history of the universe, from the Big-bank to the emergence of the life and consciousness.
- The Ways of Light (written in French, Fayard, 2007), his latest book, explains the Universe through the signals it sends us: Light. It has been awarded the 2007 Grand Prix Moron by the Academie Francaise.

All his books have orginally been written in French. They have all met the favor of a large audience and have been translated in some 20 language, including English.

Trinh Xuan Thuan is regularly invited on television and radio emissions in the US, France and other countries.

He is also a frequent guest lecturer in many countries over the world.

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VITA
TRINH XU AN THUAN

Address

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Date and Place of Birth

August 20, 1948; Hanoi, Vietnam

Education

Bachelor of Sciences in Physics (with Honors), Califomia Institute of Technology, June 1970

Ph.D. in Astrophysics, Princeton University, May 1974;

Thesis Advisor: Lyman Spitzer, Jr.

Professional Membership

American Astronomical Society; Imitational Astronomical Union

Academic Experience

1990-present: Professor of Astronomy, University of Virginia

1982-1990: Associate Professor of Astronomy, University of Virginia

1976-82: Assistant Professor of Astronomy, University of Virginia

1975-76: Research Fellow in Astrophysics at Califomia Institute of Technology and Hale Observatories.

Visiting Positions

Visiting Professor, Centre d'Etudes de Sac lay, France, January - June 2006

Visiting Professor, Institut d'Astrophysique de Paris, September - December 2005

Visiting Professor, University of Paris VII, France, February - April 2000

CNRS Visiting Professor, Institut d'Astrophysique de Paris, October - December 1999

CNRS Visiting Professor at Observatoire de Paris-Meudon, July - September 1999

CNRS Visiting Professor at Observatoire de Paris-Meudon, June - August 1998

Visiting Professor, University of Paris VII, France, October 1993 to January 1994; August 1995; July 1997

Visiting Astronomer, Observatoire de Meudon, France, June 1989; June 1993 to January 1994; August 1995

Visiting Professor, Centre d'Etudes do Saclay, France, September

1981-August 1982,February 1994-August 1994, summers 1983-1996

Visiting Fellow at Institut d'Astrophysique, Paris, France - July-December 1978, summers 1979-80

Visiting Fellow, Niels Bohr Institute, Copenhagen, Denmark, summer 1977 Visiting Fellow, Institute of Astronomy, Cambridge, England - summers 1974-1977

TRINH XUAN THUAN

Visiting Fellow, Niels Bohr Institute, Copenhagen, Denmark, summer 1977

Visiting Fellow, Institute of Astronomy, Cambridge, England-summers 1974-1977

Advisory Committees

- Vice-President of the Advisory Board, Universite Interdisciplinaire de Paris, 1995

  UNESCO Council on the Future, 1999-
- Board of Advisors, John Templetion Foundation, 2002-2004, 2008-2010
- Executive commitee, International Society for Science and Religion, 2003-2007

Awards

- Fulbright Scholar, September 1987 - August 1988 (Institut d' Astrophysique, Paris, France and Service d'Astrophysique, Centre d'Etudes Nucleaires de Saclay, France)
- Henri Chretien award, American Astronomical Society, 1992
- Asia Literary Prize from the French Lanugage Writers Association for the book 'L'infini dans la paume de la main' (Nil-Fayard) (The Infinite in the palm of the hand) (2000)
- "Glory of Vietnam" award from VietnamNet newspaper, 1 of 19 awards to honor outstanding Vietnamese-born persons living abroad (2004)
- Grand Prize Moron 2007 from the French Academy (Academie Francaise) for my book ''The Ways of light: Physics and Metaphysics of light and darkness" (Fayard, Paris, 2007). The prize is awarded to "an author writing in French for a work that favors a new ethics".

UNESCO Kalinga Laureate for Popularization of Science – 2011

Dr. Rene Raul Drucker Colin, Mexico

[Born : 15th May, 1937, Mexico City ...]

Dr. Rene Raul Drucker Colin
A Brief Biographical Profile

Email : drucker@servidor.unam.mx

Born in Mexico City in 1937, He completed his undergraduate studies at the National Autonomous University of Mexico. He did his Master's Degree from Northern Illinois University and was Research assistant in the Department of Physiology, School of Medicine in Saskatchewan, Canada where he earned his doctorate in Physiology. He taught at the school of Psychology at the UNAM and, thanks to a grant from the Foundation's Fund for Research in Psychiatry, made a stay as a Visiting Professor in the Department of Psychobiology at the University of California at Irvine. He is a Member Emeritus and research Excellence of National Research System.

He pioneered the study of neuroactive peptides in the regulation of sleep, and thus put Mexico on the world map of the neurobiology of sleep, raising the share of natural polypeptide molecules in the regulation of higher nervous function, a concept is now widely accepted.He developed the technique of simultaneous recording of unit activity in intracerebral perfusion in animals free movement, experimental line that led him to develop and propose his theory excitostatica to explain both the initiation and termination mechanism of rapid eye movement sleep (REM) as its function. We also investigated the pioneering aspects of Parkinson's disease.

He was president of Mexican Academy of Sciences. Academic Secretary of the Centre for Research in Cellular Physiology and Neurosciences department head. In the faculty of Medicine, he was head of the department of Physiology, Coordinator of Research & Graduate Biomedical Sciences. Coordinator of Scientific Research of the UNAM. He belongs to the Scientific Advisory Council of the Presidency of the Republic.

He was a Fellow of the Guggenheim Foundation. He received the National Prize of Science & Arts, the National University Prize in the Research Area in Natural Sciences, the Award Mexican Health Foundation;Miguel Otero Award of Merit in Scientific Research and Medical Excellence Award, both from the Ministry of Health, the Andres Bello Award"Clas Honor Band", awarded by the Govt. of the Republic of Venezuela, the award of the National Academy of Medicine Dr.Ruiz Castaneda. The AutonomousMetropolitan University and the Autonomous University of Puebla has been awarded as honorary doctorate. He has published 200 scientific papers. He is a leading Science Popularizer of Mexico.

Dr. Rene Raul Drucker Colin
Life & Work

Dr. Rene Raul Drucker Colin (Mexico City, May 15 of 1937) is a Mexican Scientist specializing in Physiology and Neurobiology.He collaborates regularly as a Columnist in News Papers and Magazines.

Research, Teaching and Public Outreach of Science:

He studied undergraduate career in Psychology at the Universidad Nacional Autonoma de Mexico, a Master at the University of Illinois and a Doctorate in the School of Medicine, Saskatchewan, Canada. As a teacher, he has directed more than 50 Under Graduate Thesis , Master's and Doctoral Degrees.

Professional Development:

At the National Autonomous University of Mexico , he was head of the Department of Neuro Science at the Institute of Cellular Physiology from 1985 to 1990, Head of the Department of Physiology, Faculty of Medicine from 1991 to 2000, Coordinator(Vice Rector) Scientific Research in February 2000 to December 2007. He was Research Emeritus of the Institute of Cellular Physiology and is the Head of the Directorate General for Dissemination of Science.

He was the President of the Mexican Academy of Sciences from 2000 to 2002, is a Member of the Science advisory Council of the Presidency of the Republic and National Researcher Emeritus of Excellence and the National Research System.

Awards & Honours:

Dr. Rene Raul Drucker Colin has received several awards and recognitions throughout his long & eventful scientific career. Some of them are:

- The *Guggenheim Fellowship* -1980
- The *National Science Award* by the Govt. of Mexico-1987
- The award *UNAM* in Scientific Research-1988
- *Prize of Mexican Health Foundation*-1995
- *Miguel Otero Award* of Merit in Scientific Research, The Ministry of Health-1999
- *The Medical Excellence Award* from the Ministry of Health-2000
- *The National Journalism Award* in Journalism Jose Pages Llergo University, 2005
- The *Prize "El Potosi"* by the Institute for Scientific Research Potosino & Technology(IPICYT) in San Luis Potosi - 2005
- The Award Dr. *Maximiliano Ruiz Castaneda* basic Research by the National Academy of Medicine-2005
- The *National Jounalism award from Mexico* in Research & Dissemination of Science-2008
- The Award " *Andres Belloo Order* Badge of Honour Class, The Govt. of the Republic of Venezuela, 1998
- A *Special Recognition* for Scientific Career of the International Behavioral Neuroscience Society, United States-2001
- Special Recognition for Scientific Career in favour of Mexico for the World Cultural Council-2006
- The University MeritTepantlato Presea by the Institute of Legal Sciences of the *UNAM*-2006

- *Citizen's Medal of Merit in Science and Arts* from the Federal District Legislative Assembly-2006
- *Honorary Doctor* at the Autonomous Metropolitan University in 2004, in the Autonomous University of Puebla in 2006
- *Moonlight* Citizen recognition for their participation, the Coyoacan in Mexico City on September 25,2009.
- Recognition for Outstanding Scientific Contribution to World Literature by publishing the most cited article in the last decade in the area of Pharmacologyby Thomson Reuters and the National Polytechnic Institute in Mexico City on September 29, 2009
- *Guillermo Alvarez Macias Medal* in Recognition of his outstanding as a Scientist, Humanist, Public servant, Educator & Promoter of Science in Mexico by the Cooperative Cruz Azul in Cancun, Quintano Roo, October 9,2009.
- Recognition for contribution to Science and its Communication by the National Polytechnic Institute and National Unity of Engineering Associations in Mexico City on October 16, 2009.

Perhaps no other leader occupied the imagination of the people of Odisha like Biju Patnaik; freedom fighter, pilot, industrialist, politician and philanthropist. He was Odisha's restless son and became a legendary hero. His ability to create confidence among people and inspire them was phenomenal. He had a remarkable capacity to transmit his cheerful strength to others. Biju was basically a secular man and was an instinctively nationalist as his hero Napoleon. Like Pandit Jawaharlal Nehru, he navigated by the four immutably fixed stars of his convictions – national unity, democracy , secularism and the end of imperialism. Sir Julian Huxley, UNESCO's First Director General and also a Kalinga Prize Winner, had described Biju Patnaik as a "remarkable Indian whose adventures would fill a book". In an obituary reference, the prestigious magazine The Economist says – "it is worth writing about Biju Patnaik for atleast two reasons. His long life can be read as something of a history of India back to the time when the country was run by the British. And he gave Indian politics a rare fresh of colour". The Encyclopedia Britannica described Biju as "Indian Politician; who parlayed his fame as a World War –II aviator, anti-British freedom fighter and commercial airline entrepreneur in to a political career, notably as Chief Minister of Odisha State, 1961-63 and 1990-95".

UNESCO Kalinga Prize for Popularization of Science is an international distinction created by UNESCO in 1952 following a generous grant from Late Sri Biju Patnaik, Founder and President of Kalinga Foundation Trust, Bhubaneswar in the year 1951. From 1952 to 2005, The Kalinga Prize was being presented annually by UNESCO to a person or persons, who have made outstanding contribution to the interpretation of science and technology to the general public baring the years 1973 and 1975. From 2006 to 2008, the Award was not presented since the statute and financial guidelines were being revised. Since 2009, the UNESCO Kalinga Prize is being presented bi-annually. The UNESCO Kalinga Prize is regarded as a most prestigious international recognition for outstanding science popularization work. It has so far been awarded to 65 brilliant promoters of science & technology since its inception, including 5 women. Some of the great scientists/personalities who have been awarded Kalinga Prize are Louis de Broglie (1952), Julian Huxley (1953), George Gamow (1956), Bertrand Russell (1957), Karl von Frisch (1958), Arthur C. Clarke (1961), Fred Hoyle (1967) and Sergei Kapitsa (1979). Seven Nobel Laureates have also been decorated with this great magnanimous honor of the world.

The purpose of the prize is to reward the efforts of a person who has had a distinguished career as writer, editor, lecturer, radio/television programme director or film producer, which has enabled him/her to help to interpret science, research and technology to the public. He/she is expected to have knowledge of the role of science, technology and general research in the improvement of public welfare. The UNESCO Kalinga Prize for the Popularization of Science is administered by the Science Analysis and Policies Division of UNESCO. So far the prize has been awarded to 65 people from 23 countries. They are: United Kingdom-10times,USA-8times,France -6times,India & Russia-5times,Brazil-5times,Venezuela-4times,Mexico-3times,Pakistan, Germany, Italy and Canada-2times,Vietnam, Armenia, Ghana, Philippines, Czech Republic, Nigeria, Romania, Egypt, Finland, Austria and Bangladesh-1time each.

The Book **"UNESCO Kalinga Laureates for Universal Peace"** presents a brief account on the life and works of these 65 great scientific personalities who have helped significantly to change the face of the world for a better tomorrow through public understanding of science and preserving the true scientific temperament amongst the common people. It is hoped that the book, the first of its kind, will fire the imagination of the mass for greater outreach of science and establishment of Universal Peace.