The Elusive Nobel

The Nobel medal awarded to Sir C.V. Raman

Front view of a Nobel Medal

Nobel Prize in Economics

Nobel Prize in Literature

Nobel Prize in Medicine

All medals made before 1980 were made of 23K gold. Today they are made from 18K green gold plated with 23K GOLD. The weight of the medal varies with the value of gold, but averages about 175g for each medal. The diameter is 66mm and the thickness varies between 5.2 and 2.4 mm.

source : www.nobel.se

Nobel Prizes are awarded to eminent scientists in the world for their outstanding contribution to the field of science and humanity. Experts debate the inability of Indian scientists to win Nobel Prizes and the genuinity of the Nobel system.

■ **G.P. Vinayababu**

'.....It is my express wish that in awarding the prizes no consideration be given to the nationality of the candidates, but that the most worthy shall receive the prize, whether he be Scandinavian or not'.

-Alfred Nobel in his Will

Nobel laureates for the year (1997)

The Nobel Prize in Chemistry

Prof. Paul D. Boyer	**U.S.A.**
Dr John E. Walker	**U.K.**
Jens C. Skou,	**Denmark**

The Noble Prize in Physics

Prof. Steven Chu	**U.S.A.**
Prof. Claude Cohen-Tannoudji	**France**
Dr. William D. Phillips	**U.S.A.**

The Noble Prize in Medicine

Dr. Stanley B. Prusiner	**U.S.A.**

One aspect is strikingly apparent in this impressive list of Nobel laureates. We see only scientists from the U.S.A. and European countries making up the list. This is not the first time that the US has garnered the highest number of prizes in all streams of science. It has been a regular feature with the North American country to get Nobel Prizes with compulsive regularity every year. The performance has been even better in the last 27 years. Scientists from the United states who had obtained a total of 83 prizes in the three science fields of Physics, Chemistry and Medicine till 1970 have added a further 102 prizes in just 27 years since then. This is surely an indicator of the strong scientific tradition in the United States. Following suit are Great Britain, Germany and France with 69, 58 and 24 prizes respectively.

Prof. C.N.R. Rao
President, JNIASR

I don't know how many Indians would support other Indians to get a prize. I can't say there is a prejudice. It is a case of 'out of sight-out of mind'. Indirectly one gets ignored from India" .

Nobel Prize which is awarded every year for the best achievement in experimental science in different fields of science was introduced in 1900 as per the will of Alfred Nobel, a great scientist and humanitarian of the 19th Century. Alfred Nobel was a scientist, an inventor and a dynamic industrialist. Nobel was interested in social and peace related issues and held what were considered radical views in his era. He had a great interest in literature and wrote his own poetry and dramatic works. In his will (see box), he reflected his love for science, peace and literature by bequeathing all his property for the benefit of those individuals who contribute significantly every year for the progress of science, peace and literature in the world.

Since 1901, the Nobel Prizes are being presented to the laureates at ceremonies on December 10, the anniversary of Alfred Nobel's death.

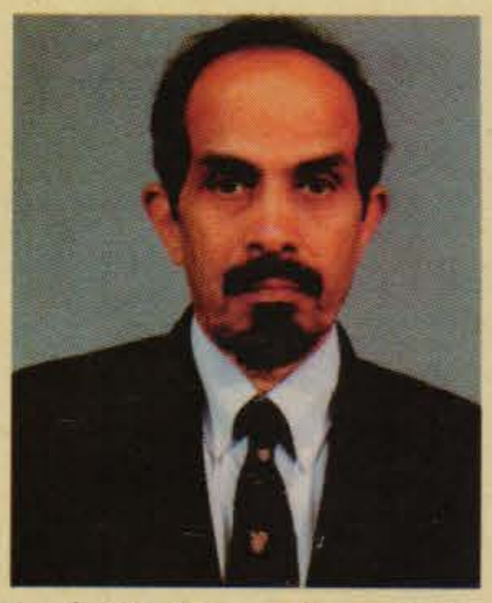
Nobel Prize is synonymous with the best of scientific achievement in the world today. But does Nobel Prize really identify the best. The experts are unanimous in saying No!

"There are many scientists who deserved the Nobel Prize, but didn't get it. But all those who got the Nobel Prize deserved it". Says Prof. Ramaseshan, Professor Emeritus, Raman Research Institute and a close associate of Sir C.V. Raman - the only Indian Nobel Prize winner in science.

"Some very great scientists haven't got it. The father of Modern Chemistry didn't get the Nobel Prize" says Prof. C.N.R. Rao,

How are Nobel laureates selected?

1. Each year the respective committees send individual invitations to the thousands of scientists, members of academies and university professors in numerous countries, asking them to nominate candidates for the Nobel Prizes for the coming year. Those who are competent to submit nominations are chosen is such a way that as many countries and universities as possible will be represented.
2. These prize nominations must reach the respective Nobel Committees of the prize-awarding institutions before February 1 of the year for which the nomination is being made.
3. The nominations received by each committee are then investigated with the help of specially appointed experts. When the committees have made their selection among the nominated candidates and have presented their recommendations to the prize-awarding institutions, a vote is taken for the final choice of Laureates.
4. The choice of the year's Laureates is announced immediately after the vote in October each year.
5. The prizes are awarded at the Prize Awarding Cermony at the Concert Hall in Stockholm, Sweden, on December 10 (the Anniversary of Alfred Nobel's death). The Nobel Peace Prize is awarded on the same day at the City Hall in Oslo, Norway.



Prof. Roddam Narasimha
Director, NIAS

The number of Indians who win Nobel Prize I hope will increase very soon. My fear is it will not. If you want to do science of that kind which is internationally established, we need to give science a great deal more attention.

The Prize Amount in Swedish Crowns

Year	Amount in Crowns
1901	150,800
1920	134,000
1923	115,000
1940	138,600
1946	121,000
1950	164,300
1953	175,300
1960	226,000
1969	375,000
1970	400,000
1980	880,000
1989	3,000,000
1990	4,000,000
1991	6,000,000
1992	6,500,000
1993	6,700,000
1994	7,000,000
1995	7,200,000
1996	7,400,000
1997	7,500,000

President, Jawaharlal Nehru Centre for Advanced Scientific Research and one of the most respected scientists in the country. The same view is shared by Prof. Roddam Narasimha, Director, National Institute of Advanced Studies and formerly Director of NAL. "People who have won the Nobel Prize are not necessarily the greatest scientific minds. Sometimes it so happens that the discovery for which a scientist gets the prize is disappointingly small in comparison to his overall contribution to science. Sommerfield, the celebrated German scientist never got the Nobel Prize although most of his students did".

"The other way around" he says "discoveries are simply made by chance. It is a case of a person being at the right time, at the right place, with the right tool".

Also most scientists feel that science is not considered comprehensively to include all disciplines, in awarding Nobel Prizes. It is confined to only three major fields - Physics, Chemistry and Medicine. "There are many other fields in which there are no Nobel Prizes. For example the geophysical science and astronomy. There is no prize for outstanding achievement in astrophysics unless it is considered a part of Physics" says Prof. Narasimha. Mathematics which is one of the purest sciences isn't included in the Nobel system. There is an interesting story which does rounds on this issue. It is said that Nobel's wife eloped with a mathematician which made him hate all mathematicians.

Even in the fields of science included in the Nobel system, Asians in general and Indians in particular haven't fared well. The only countries from Asia which have opened their accounts in the Nobel tally are Japan, Israel, India and Pakistan.

Indian scientific talent undisputedly is on par with the best in the world. Indians who have gone abroad have shown that a little push in the right direction can make a big difference. Apart from C.V. Raman who is the only Indian to have got a Nobel Prize in science, two other Indians - Har Gobind Khorana and Subramanyan Chandrashekar got it after they obtained U.S. citizenships. With such great brains, why is it that India has got only one prize to its credit so far?

The reason probably is that we are losing major part of our intelligentia to other countries in the form of 'brain drain'. The best brains from India are serving the growth of developed countries in the world. Prof. Narasimha feels that this is one of the main reasons why Indians aren't among the chosen lot for the coveted prize. "India has lost very good talent by way of migration" says he. Prof. Rao decries the attitude of Indians taking credit for the achievement of migrated Indians. "Indians in America should not be treated as Indians. We unnecessarily call them Indians".

But, the reason for Indians not getting the Nobel Prize is not migration alone.

Prof S. Ramaseshan
Professor Emeritus, RRI

"To work on science, a peculiar kind of freedom is required. All the good things should be provided. In India once somebody does a good work in science, he will be made the Director of some institute or body".

There are several other reasons for it. Even those scientists remaining in India, aren't getting the required boost to make it big. "Doing science at the frontiers of science is still not easy in India. That kind of extraordinary encouragement of talent required to make sure it is at the frontier, is not present here. We spend very little money, on science. Even if we spend money it is not enough to give all advantages that scientists need. Atleast not enough to discover their full potential. Money is necessary, it is not sufficient. You need infrastructure. You need an atmosphere where talent will prosper. Bright people should be picked up very early and supported very strongly with money and infrastructure. Infrastructural support in India, even in the best of institutions, which we think are strongly supported, is still insufficient" opines Prof. Narasimha. "Experimental work in the last 20 years has become very competitive, advanced and sophisticated. The gap between India and developed countries is only increasing instead of decreasing" says Prof. C.N. Rao. He continues "facilities in India are not enough. I cannot even get electricity in

Nobel Souls

India has got three Nobel prizes so far, of which only one of them is for the work in the field of science, in the 97 years history of Nobel Prizes. There are two other scientists of Indian origin who have got Nobel prizes as U S nationals. Apart from that two foreign citizens have got Nobel awards for their work in India.

Indian Nobel prize winners

Rabindranath Tagore (1861-1941)
Nobel Prize in Literature - 1913

"Because of his profoundly sensitive, fresh and beautiful verse, by which, with comsummate skill, he has made his poetic thought, expressed in his own English words, a part of the literature of the West"

Rabindranath Tagore was educated at home; and although at seventeen he was sent to England for formal schooling, he did not finish his studies there. In his mature years, in addition to his many-sided literary activities, he managed the family estates, a project which brought him into close touch with common humanity and increased his interest in social reforms. He also started an experimental school at Shantinekatan where he tried his Upanishadic ideals of education.

Tagore had early success as a writer in his native Bengal. With the translations of some of his poems into English he became rapidly known in the West. In fact his fame attained a luminous height, taking him across continents on lecture tours and tours of friendship. For the world he became the voice of India's spiritual heritage; and for India, especially for Bengal, he became a great living institution.

Sir Chandrasekhara Venkata Raman (1888-1970)
Nobel Prize in Physics - 1913
Calcutta University

"for his work on the scattering of light and for the discovery of the effect named after him".

Chandrasekhara Venkata Raman is earliest researches in optics and acoustics- the two fields of investigation to which he has dedicated his entire career- were carried out while he was a student.

In 1922 he published his work on the "Molecular Diffraction of Light", the first of a series of investigations with his collaborators which ultimately led to his discovery, on the 28th of February, 1928, of the radiation effect which bears his name ("A new radiation", Indian J.Phys., 2 (1928) 387), and which gained him the 1930 Nobel prize in Physics.)

Mother Teresa (1910-1997)
Nobel Prize in Physics - 1979

Mother Teresa was born in Skopje in what is now Yugoslavia on August 27, 1910. Her original name was Agnes Gonxha Bojaxhiu. At the age of eighteen she left the parental home in Skopje and joined the Sisters of Loreto, an Irish community of nuns with a mission in Calcutta. After a few months' training in Dublin she was sent to India, where in 1928 she took her initial vow as a nun.

In 1946 she received permission from her superiors to leave the convent school and devote herself to working among the poor in the slums of Calcutta. Although she had no funds, she started an open-air school for homeless children. Soon she was joined by voluntary helpers, and financial support was also forthcoming from various church organisations, as well as from the municipal authorities. This made it possible for her to extend the scope of her work, and on October 7, 1950, she received permission to start her own order "The Missionaries of Charity", whose primary task was to love and care for those persons nobody was prepared to look after. Today the order comprises some one thousand sisters and brothers in India, of whom a small number are non-Indian.

U S Nobel Prize winners of Indian Origin:

Har Gobind Khorana (USA) (b.1922)
Nobel Prize in Medicine - 1968, University of Wisconsin Madison, WI, USA.
"For their interpretation of the genetic code and its function in protein synthesis"
Har Gobindo Khorana was born in Punjab on January 9th, 1922. Khorana lived in India until 1945, when the award of a Government of India Fellowship made it possible for him to go to England and he studied for a Ph.D degree at the University of Liverpool. In 1910 Khorana moved to the Institute for Enzyme Research at the University of Wisconsin. He became a naturalised citizen of the United States. 1970 Khorana became the Alfred P. Sloan Professor of Biology and Chemistry at the Massachusetts Institute of Technology.

Subramanyan Chandrashekhar (1910-1995)
Nobel Prize in Physics - 1983, University of Chicago
"for his theoretical studies of the physical processes of importance to the structure and evolution of the stars"
Subramanyan Chandrasekhar was born on the 19th of October 1910. In July 1930 he was awarded a Government of India scholarship for graduate studies in Cambridge, England. In Cambridge, he became a research student under the supervision of Professor R.H. Fowler (who was also responsible for his admission to Trinity College). On the advice of Professor P.A.M. Dirac, he spent the third of his three undergraduate years at the Institute for Teoretisk Fysik in Copenhagen. He joined the faculty of the University of Chicago in January 1937. And has remained at this University ever since, where he ultimately got the Nobel prize in 1983.

Bangalore, what to say of others. I have my own electricity and water supply. All the time I am either writing papers or taking care of electricity and water supply" says Rao in a lighter vein. The problem most people feel, is at the grass root level. "One of the most serious problems we face in India is that the younger generation don't want to get into science. Nobody has educated them that science can be exciting. Earlier it used to be IAS that younger people fancied getting into. Now it is engineering or management. They don't understand that doing science is a joy. They are all just behind money" says Prof. Ramaseshan. Further he says "To work on science, a peculiar kind of freedom is required. All the good things should be provided. In India once somebody does a good work in science, he will be made the Director of some institute or body". He reiterates Prof. Narasimha's stance that money is not the only thing which encourages scientific endeavour. "Talent search should begin from the school level" he says.

The history of Nobel Prize brings about one clear aspect. The United States and European countries have stolen the limelight and the third world countries including Asia, Africa and South America haven't received many Nobel Prizes. Does it mean, there is an intentional bias towards third world countries?

The scientific community in India categorically deny any such thing as a 'bias'.

While ruling out an intentional bias, scientists agree that Indians and scientists from other third world nations are at a disadvantage.

"I do think that the scientists working in the third world countries have a harder time. There is absolutely no doubt about it. If you are to make a mark in the world, it is much harder here than in the advanced countries. Scientists working in the third world countries start with a disadvantage. Even if they do something good, people take a longer time to accept it. I am not sure if there is an intentional bias. But in the end a certain bias operates against them". Says Prof. Narasimha. "In India even if you do outstanding work, it is difficult to get recognition. The first thing

The Will

"The whole of my remaining realisable estate shall be dealt with in the following way: the capital, invested in safe securities by my executors, shall constitute a fund, the interest on which shall be annually distributed in the form of prizes to those who, during the preceding year, shall have conferred the greatest benefit on mankind. The said interest shall be divided into five equal parts, which shall be apportioned as follows: one part to the person who shall have made the most important discovery or invention within the field of physics; one part to the person who shall have made the most important chemical discovery or improvement; one part to the person who shall have made the most important discovery within the domain of physiology or medicine; one part of the person who shall have produced in the field of literature the most outstanding work of an idealistic tendency; and one part to the person who shall have done the most or the best work for fraternity between nations, for the abolition or reduction of standing armies and for the holding and promotion of peace congresses. The prizes for physics and chemistry shall be awarded by the Swedish Academy of Sciences; that for physiology or medical works by the Kaarolinska Institute in Stockholm; that for literature by the Academy in Stockholm, and that for champions of peace by a committee of five persons to be elected by the Norwegian storting. It is my express wish that in awarding the prizes no consideration be given to the nationality of the candidates, but that the most worthy shall receive the prize, whether he be Scandinavian or not."

people think of when it comes to science is America and Europe, that's all. Moreover India doesn't have a strong scientific community supporting a potential Nobel Prize winner. I don't know how many Indians would support other Indians to get a prize. I can't say there is a prejudice. I can say it is a case of 'out of sight-out of mind'. Indirectly one gets ignored from India" . Says Prof. Rao.

"The best period in the 97 year Nobel history, when we should've got the Nobel Prize is in the past 50 years. Before that we were under the British rule and science was not encouraged. There were hardly few people who did science prior to our Independence" says Prof. C.N. R. Rao. But significantly it was only before Independence that Indians have achieved any thing which can be described as world class in Science. There were a handful of Indian scientists who did tremendous contribution to science especially in, Physics, the field in which Sir C.V. Raman got the Nobel Prize. One name which every scientist, present and past, unanimously agree upon, who didn't get the Nobel Prize is Prof. S.N. Bose. "S.N. Bose should've got it. Any where else in the world he would've got it. He is the man who discovered Bose-Einstein statistics" says Prof. Rao. Agrees Prof. Ramaseshan. "S.N. Bose formulated one of the cardinal principles of Quantum mechanics. In fact, work based on Bose's idea of condensed matter has got many Nobel Prizes including one this year". Prof. Narasimha while saying that atleast two contributions from Indians didn't receive due recognition feels that it is not proper for us to make a big point of that. "There are people in other countries also who deserved and didn't get it".

"S.N. Bose is the only obvious omission from India. I can't think of any body from India who has been ignored" says Prof. Rao. But there are atleast two other scientists who were in the race along with Prof. S.N. Bose, but couldn't get the Nobel Prize - Prof. M.N. Saha who discovered the ionisation formula and George Sudarshan who did pioneering work in particle Physics.

M.N. Saha's discovery of ionization formula in 1920, S.N. Bose's derivations of quantum mechanics in 1924 and Raman's discovery in 1928 - all were significant scientific discoveries with profound influence on the future of science. But only Raman's discovery got the Nobel Prize. Raman's discovery of light scattering was such an important discovery in the field of Physics that atleast 12 to 13 scientists from all over the world proposed his name for the Nobel Prize in 1930. "Scientists from England, Germany and France including Prof. Sommerfeld, the great Physicist from Germany proposed Raman for the Nobel Prize" says Prof. Ramaseshan.

Nobel System

Nobel foundation has a systematic step-by-step method to choose the Nobel laureates. As per Alfred Nobel's will, some of the academies in Sweden have been entrusted with the responsibility of managing and disbursing funds in the form of prizes.

Even with all the necessary care taken to see to it that there is no scope for distrust, the Nobel system is accused of favouritism. The Russian scientific establishment has recently criticised the Nobel foundation of being partial in awarding prizes. But Indian scientists rule out any such fault in the system "In any system, any committee, you can find a fault" says Prof. Rao. Adds Prof. Ramaseshan "There is no scope for favouritism. Nomination papers are sent to all major universities in the world. Once the nominations are received, it will be scrutinised and preliminary screening will be done by the respective committees. After that the nominations are sent to top scientists in the world to get their opinions. By the nomination stage itself people would know who would get the prize". Clarifying the same point Prof. Narasimha says "The problem is the world has to recognise a discovery. Of course, the decisions are not made in India which perhaps makes some people think that the system is wrong".

But when it comes to fields other than science in which Nobel Prizes are awarded, there seems to be a clear inconsistency "In the peace prize for example, the system is clearly wanting. How can you have a system where Gandhi didn't get the Nobel Prize for peace but Churchill did?" questions Prof. Narasimha.

Contribution to the society

A very basic question arises at this point of time. How far is the contribution made to basic theoretical science beneficial to humanity? The ultimate aim of scientific research is to make the world a better place to live in. If the discoveries wouldn't have a bearing on society, atleast in the near future, then it is not worth the effort and time. "I do think Nobel Prize has distorted our perception of the contributions made to society" says Prof. Narasimha "Engineering and technology have suffered in particular. There is no prize for the contribution in engineering and technology in the Nobel system. But some of the technological developments have transformed the way we live. Take jet engine for example. Everyone will agree that it is a great invention. But none knows who did it".

Why blame the West?

If you have an idea which is different from what is universally accepted, you have a fight every where in the world. But the fight in a developing country is longer and harder. We should not think of that as something unusual. Let us accept facts. We read only Western literature. We can't blame the West for it entirely. How many Asian journals do Indian scientists read? Even in reading foreign literature, we are extremely selective. We don't read German or French journals. We are strongly hooked on to Anglo Saxan system of science in the world. So we can't blame them too much. We are ourselves guilty of bias.

-Prof. R. Narasimha

Future

Every scientist we spoke to is optimistic about Indians getting the Nobel Prize in future!. "Let us first accept the fact that we haven't made any extraordinary contribution in any field of science so far to deserve a Nobel Prize. After Raman, SN Bose and Sudarshan we're not made any world class discovery in Physics. Japanese good in applied science but not in basic science. To get the Nobel Prize there needs to be a tremendous tradition of science. We are slowly building it. In the next 10-12 years, we will be able to produce something of that order" says Prof. Ramaseshan.

"There are a few people in India who are capable of competing with international standards. But we never know if they can win the Nobel Prize. The only thing what we can do is, to be constantly working towards it and see if we can get it" says Prof. Rao.

The same view is shared by Prof. Ramaseshan who recollects Sir C.V. Raman's words 'Don't think about submitting a thesis just for the sake of a doctorate. Work with a single minded devotion in your field. After working on it for sufficient period of time, put the research findings in the form of a book and send it across. That will fetch you a doctorate'. The same thing applies in the case of a Nobel Prize, says he.

Prof. Mukunda, Department of Physics, Indian Institute of science Bangalore "we have to work hard and try our best".

Probably the best explanation about the future of Indian Science as far as Nobel Prize is concerned came from Prof. Narasimha.

"I have absolutely no doubt that Indians will get the Nobel Prize. The talent in this country is extraordinary. I don't think we know how to exploit and manage this talent. The number of Indians who win Nobel Prize I hope will increase very soon. My fear is, it will not.

If you want to do science of that kind which is internationally accepted we need to give science a great deal more attention, we've to spend more money. We've to encourage scientists when they are young. Our education system has to change and so on. There are large number of things connected with each other".

Are we up to it? ❑