

Summary!

- ✓ (1) Thanks to Prof. Rajagopal & Srinivasan - only personal reminiscences.
- ✓ (2) At Calcutta Univ. 1919-21 - His certificate.
- ✓ (3) Meeting at Bangalore on 16/3/1928 - S.J. Sc. Assn - Nobel Prize 1930 - congratulations sent to him & his ack.
- ✓ (4) Academy founded 1934 - connection with the same.
- ✓ (5) Prof. Max. Born's stay at Inst. during 1936. - Relations between him & Sri C. V.
- ✓ (6) Secretary; Sec A of the Academy - 1937-58 - also V. P. 59-61.
- ✓ (7) Tributes of Sri C. V. while director, (8) Proposal to put me at Inst - Bhabha.
- ✓ (8) Uniform kindness towards me - At time of going to Poona.
- ~~(9) Welcome to Ram an Inst. after return to Bangalore.~~
- ✓ (10) Personal tribute to Sri C. V.

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Popular lectures delivered by him

- 1946 (Allahabad) - Gems.
- 1967 (Madras) - Atmosphere of the Earth
- 1943 (Hyderabad) - Diamond, the Prince of solids
- 1940 (Waltair) - Structural colours.
- 53 (Ahmedabad) - Iridescent shells
- 1947 (Cuttack) - Smell & Taste.
- 1960 (Madras) - Music & musical instruments

- (1) Thanks - personal remembrance.
- (2) Calcutta Univ.
- (3) 3-D. Sc. M² lecture.
- (4) Secy of the Academy.
- (5) Born & Raman - trouble at Inst.
- (6) Bholke & A.E. C
- (7) Personal ~~thanks~~. 1/2 book

Rao Bahadur B. Venkatesachar

1879 - 1972

Foundation Fellow 1935

* in an orthodox Brahmin family of the "Kashyap Gotra" ^{Gotra}

family life

Birth, parentage and Childhood

Bachalli Venkatesachar was born on 18th June 1879 at ~~Chickballapur~~ ^{Bachalli} Chickballapur, Kolar District, of the then Princely State of Mysore (now Karnataka). His father was Sri Vyasarayachar, a lawyer of Chickballapur and mother was Smt. Achamma. Even from childhood Venkatesachar must have been greatly influenced by his mother, a gracious lady known for her devotional religious ~~nature~~ ^{bent of mind}, and generous nature. His grandfather Chaturdasa Vidyachakravarti Lakshmanachar was a famous Asthana Vidwan at the ~~palace~~ court of ~~the~~ Mumtaz Ali Krishna Raja Wodeyar, Maharaja of Mysore, and was well known for his erudition in Sanskrit and his deep knowledge of the Dwaita philosophy of ~~Madhvacharya~~ ^{the great Madhvacharya Venkatesachar}. This family tradition ~~must have~~ had a great influence on him even in his younger days, and explains why, after retirement from his scientific career, he took ^{keen} ~~great~~ interest in ~~Dwaita~~ philosophy, making valuable contributions to it, and encouraging innumerable institutions and individuals engaged in religious and philosophical pursuits. As was the custom in those days he ~~was~~ married very early in 1892 to Smt. Padmarati Bai from Hospet, and lived a long happy Grihastha life.

~~His three sons are~~ asa Grihastha. [vide reverse]

School and University education
His earliest education was at ~~Bachalli~~ ^{Chikkaballapur} Bachalli itself in the ~~Grand~~ Gurukul of Sri. Subba Bhatta who initiated him into the beginning lessons in ~~Sanskrit~~ ^{Sanskrit}. Later he started his English education in the High School at Chickballapur. In addition to acquiring a good ~~wide~~ ^{elementary} knowledge of English, he showed keen interest, even in those early years, in ~~Mathematics~~ ^{Mathematics}.

still happily with us.

His ~~thence~~ ^{has} he had three sons and a daughter. The first son Dr. B.V.

Raghavendra Rao ^{was} Librarian ^{from} at the Indian Institute of Science, Bangalore and later at the Delhi University, and ~~now at the Institute of Social Sciences, Bangalore is~~ a distinguished worker in Physics. His second son Prof. B.V. Narayana Rao

has been Professor of Physics & Principal of the Vijaya College, Bangalore and his

third son ^{Sri} Prof. B.V. Krishnamurthy ~~is~~ ^{is} associated as Professor in the Engineering College, Manipal, Karnataka State. Prof. Venkatasachari's son-in-law

Sri G.M. Krishnamurthy ^{retired as Superintendent of Engineer (Electrical).} is well known as a keen student of Vedānta philosophy.

himself a distinguished worker in Physics, was Asst. Professor of Physics at Central College, Bangalore, before becoming the Librarian at the Indian Institute of Science, Bangalore. Later he was the University Librarian & Head of the Dept. of Library Science at the University of Delhi.

At present he is connected with The Institute for Social & Economic Change, Bangalore as its Hon. Library Advisor.

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and elementary science. At the early age of 13 he passed the Matriculation (2) Examination in 1892, and, remarkably enough, out of the 12 students who appeared for the examination from the High School, he was the only one to secure a pass. He then joined the Central College to study in the F. A. and B. A. classes. He speedily showed that he was one of the best students of his class by carrying off the 2nd prize in the junior F. A. class, in 1894. ~~the~~ Next year he passed the Madras University F. A. examination from the Central College securing a first class, and gaining one of the Government special scholarships. He continued to maintain his position in the B. A. classes for he gained the first prize in the junior B. A. class as well as in the Senior B. A. class also. He not only passed the University Examination for the B. A. Degree in all the three branches at the first attempt ~~and~~, but also took a second class in English, and a First class in Physical Science standing second in rank for the whole of the Presidency of Madras, and gaining the Government Physical Science Prize of Rs 100/-.

As testified by Prof. Cook, the then Principal of the Central College, he was a model of ~~regular attendance~~ regularity in his attendance, of earnest attention to his work and of modesty in his demeanour. On the recommendation of Prof. Cook, the Government of Mysore awarded him a scholarship to proceed to Madras for the Masters Degree in Physics. He joined the Presidency College, Madras and in 1900 took his Masters Degree in Physics being the only one to do so in the batch that appeared for the examination that year. It is worth recording that as a student of the Central College he was a contemporary of ^{some} many brilliant men who later distinguished themselves in many walks of national life. Prominent among these was the great son of India, Chakravarti Rajagopalachari, or Rajaji as he is known to millions of his countrymen. Rajaji's intimate friend, Navaratna Rama Rao was also a contemporary of Venkatsachar, and wrote to him a warm letter of congratulations on his attaining 80th

birthday, recalling a friendship between them of 60 years' standing.

Professional career.

Almost immediately after passing his M.A. Degree Examination, his services were availed of for work in the Central College. When Prof. Cook, Principal and Professor of Physics went on leave for three months from 30/6/1900, the Govt. of Mysore appointed Venkatesachar as a temporary lecturer in the Physics Dept. for this period of three months. He was made a permanent lecturer in 1903, and looking back ~~these three~~ ^{three} ~~quarters~~ ^{quarters} of a century, it is historically interesting to note that the G.O. on this appointment stated "Govt. are pleased to sanction the proposed appointment of Mr. B. Venkatesachar as an additional ~~Science~~ ^{Assistant} Assistant in the Central College. He will be placed in class C. III of the Educational officers on a starting ~~salary~~ pay of Rs 130/- a month? Perhaps there was no class D or a Class C. IV in those days! Thus Venkatesachar literally rose from the lowest rung of the ladder in his professional career as a teacher of physics. During the short period of four years from 1903 to 1907, in which year Prof. Cook died, he made his mark as a successful lecturer, and consequently there were no hurdles to his attaining higher status in his official capacity. In 1908, Dr E.P. Metcalfe, a brilliant student of the University of London, who had made original contributions to Physics both at London and Cambridge, where he worked in the Cavendish laboratory under J.J. Thomson, was appointed Professor of Physics in the Central College in the place of Prof. Cook. This appointment coincided with the reorganisation of studies by the Madras University to which the Central College was affiliated, and this reorganisation resulted in the introduction of the new Intermediate and B.A. Courses with practical work in science subjects. Venkatesachar was of great help to Dr Prof. Metcalfe in planning and building the Dept. of Physics on sound lines, and the Dept. was well equipped for work in 1912. Later the founding of the Mysore University in 1916 ^{thanks to the foresight of Sir M. Visvesvaraya} gave a further impetus to advanced work and research in the Department, and a natural corollary of these activities was the promotion of Venkatesachar as an Assistant Professor. When Dr. Metcalfe was appointed as Principal in 1917 in addition

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to his duties as Professor of Physics, the need naturally arose for a full time
Professor to be in look after the Dept, and in course of time Venkatesachar
was the natural choice for this Professorship. [vide Reber's letter] when Dr. Metcalfe retired in
1929 as the Principal and was appointed Vice-Chancellor of the Mysore
University, Venkatesachar was promoted to a full University Professorship.

He also acted for sometime as Principal of the Central College during the
year 1930. [It was in the same year that the title of "Rao Bahadur"

was conferred on him by the then British Government at the Centre in
recognition of his eminence as a Professor of Physics, and his devoted
service to the cause of education in the Mysore State. In the same [vide memo (b)] 1930
year he presided over the Physics Section of the Indian Science Congress
held at Allahabad, and came in contact with many distinguished
Physicists of the country including Meghnad Saha. Rao Bahadur

Venkatesachar was elected a Fellow of the Institute of Physics (London)
in 1932. Meghnad Saha supported this nomination application form for this
Fellowship, and in his letter to Venkatesachar intimating this support,
Saha remarked "your name should be proposed for the Fellowship
of the Royal Society. Why should you want this poor thing?"

This shows the high esteem in which he was held by many of his the
distinguished Physicists of the day in India. After a close association
of over 35 years with the Central College, and after throwing all his
initiative, his untiring energy and enthusiasm in building up and
nourishing the Dept of Physics, he retired from the University in
1937. He was presented on 18th June 1937 with an Address by the
members of the Physics Staff of the College praising in glowing terms
his qualities of head and heart, and his distinguished service
to the cause of Physics teaching and research in Physics.

Even after retirement he did not completely sever himself
from his activities as an educationist. He served as an acting

(a) The reputation of the Department while he was a Professor was such that Prof. C. V. Raman thought it fit to announce the discovery of the Raman effect - at a ^{historic} meeting held under the auspices of the South Indian Science Association on 16th March 1928 in ^{the} ~~the~~ ^{lecture} hall P₁ of the Department of Physics of the Central College; ~~this~~ ^a lecture hall ~~was~~ now ~~been~~ appropriately named as the Raman Lecture Hall.

(b) When this distinction was conferred on him, the members of the Staff of the Physics Department of the Central College presented him with an Address in which they acknowledged in glowing terms the service rendered by him to the University, ~~and in general~~ ^{to} by training a generation of students. It was also pointed out in the Address that he was the first Professor of the Mysore ~~to~~ to be so honoured in the Mysore University. It is correct to say that he was the first and the last Professor of the University ^{in the Faculty of Science} ~~to receive such a~~ signal honour from the Government of India.

Director of the Indian Institute of Science, Bangalore from 1937 to 1939. He founded the Bangalore High School in 1942, and was ~~a~~ for a long time the President of the Managing Committee of that Institution. He also founded the Vijaya College in 1944, and was Principal of that Institution from 1944-51. On the occasion of the 70th birthday in June, 1949, both these institutions presented him with Addresses eulogising his services to the Cause of education in the State.

Throughout his career in the University, he had the reputation of being a devoted teacher, and a scintillating lecturer. His associations with his colleagues were always cordial, and many of them acknowledged his generous attitude towards them in encouraging research. Specially when teaching small classes like ^{those for} the Honours & Master's Degree, he followed a particular technique characteristic of him. After a few lectures to the classes embodying the introduction to a subject, he ^{gave} ~~wrote~~ them to ~~look up references~~ a list of references, and urged them to study the relevant topics in those books. Later he used to sit with the students in the benches, and ask ^{them} ~~the~~ to explain what they had studied, ~~and~~ enquired ^{about} at the same time the difficulties they had encountered in understanding particular aspects. In order that ^{all} the students might participate in this novel exercise, he used to distribute ~~to~~ numbered brass billets to them, call the numbers & ~~ask~~ the respective students to the Board to explain points which they had understood. There used to be a joke among his students in those days, of course outside class hours, as to the number of billets he used, some maintaining that ~~the number~~ ^{it} was equal to the number of elements in ^{Mendeleev's} ~~the~~ periodic table, and others maintaining that it only went up to 77 the atomic number corresponding

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Iridium since Venkatesachar himself had done some valuable work on ~~the~~ iridium isotopes. ^[Vide reverse] Some of his other mannerisms ~~was~~ were to sit on the table while lecturing, sometimes walking round the table and at other times moving among the students themselves. He had ~~also~~ a keen sense of humour although sometimes ^{he was a little} ~~indulgent~~ in short-tempered ~~remarks~~ when ^{to him} ~~over~~ unnecessarily annoyed. No student who took a difficult problem for solution came back disappointed, for he took great pains in resolving the difficulty to the satisfaction of the student. He has been loved and respected by a whole generation of students, among whom special mention might be made of the well-known Kannada litterateur Masti Venkatesa Dyenjar, the doctors S. Subba Rao & B. K. Narayana Rao, and H. V. R. Dyenjar former Governor of the Reserve Bank of India.

Research work.

The scientific work of Venkatesachar may be broadly described as experimental spectroscopy based on theoretical ideas of Bohr's old quantum theory. This work can be roughly classified under three headings viz (1) Analysis of atomic spectra, (2) The Raman effect and (3) Hyperfine structure of spectral lines in relation to nuclear structure. In all this work he was ably assisted by his colleagues Drs. L. Subaiya & T. S. Subbaraya.

His earliest papers were in collaboration with Dr. Metcalfe published in the Proceedings of the Royal Society related to the absorption of light by electrically luminiscent vapours. This work having an important bearing of Bohr's theory of spectral radiation attracted the attention of many physicists of the time. Thus, these experiments were repeated in the Univ. of Toronto, Canada by McLennan and others who confirmed the results obtained in the Central College Physics Laboratory. Of work on this topic, special mention might be made of two papers

Almost every Saturday in the week, colloquia were arranged in the Dept
in which the staff, the advanced level students, and research workers
collaborated and discussed several topics of current interest.

published independently by Venkatesachar ~~and published~~ in the Phil Mag ^{vortex} (Jan, 1925), and Proc. Roy. Soc A, Vol. 117, 1927. In these papers he studied the influence of the length of the radiating column on the width of spectral lines, and the density of the vapour in the Mercury arc and the relative intensities of the radiated spectral lines with special reference to the forbidden line 2270. These two papers show clearly how the Bohr theory could explain satisfactorily the ~~various~~ ^{numerous} ~~spectral~~ spectral lines obtained under varying experimental conditions.

This work of Venkatesachar published in the Proc. Roy. Soc. Vol. 117, 1927 indicating the results of changes in the density on variation led to an important paper in conjunction with T. S. Subbaraya on the first spark spectrum of mercury published in the Zs. f. Physik. Bd. 5, 1931. This paper was also the catalyst for further work of Subbaraya ^{secured} on ~~spark~~ spectra and of ^{B.V.} Rayhendra Rao on the spark spectra of Gold and Copper and the second spark spectrum of silver.

Soon after the discovery of the Raman effect Venkatesachar interested himself in this effect this new phenomenon, and devised a in collaboration with Subbaraya a new type of very effective apparatus for the study of the effect. This apparatus has been described by Kohlrausch in his well-known book on the Raman effect, and was used for the study with a number of substances examining, in particular, the wings accompanying the Raman lines.

Perhaps the most significant ^{contribution} of Venkatesachar to physics was the study of the fine structure of spectral lines in relation to properties of the nucleus. This subject was what he chose for his Presidential Address to the Physics Section ~~of the~~ Indian Science Congress held at Allahabad in 1930, and

is entitled "The fine structure of spectral lines in relation to selective absorption." Based on the fundamental notions experimental work set forth in this address, he proceeded in collaboration with his colleagues to determine the isotopic constitution and the nuclear spins of the elements of Platinum, Iridium and Gold which has for a long time resisted the attempts of Aston and others to obtain their isotopic constitution by means of the mass spectrograph. Suggestive papers were also published later on the constitution of ~~the~~ the constitution and magnetic moments of ^{atomic} nuclei.

The quantum theory was only in its early stages of development at the time, and no real relativistic quantum theory then existed ~~at the time~~. Also the experimental results relating to elementary particle and nuclear physics were very meagre. Considering all this, Venkatesachar's work at that early stage which ^{brought forth} ~~showed~~ clearly the necessity for further theoretical and experimental work in the domain was certainly a tribute to his physical insight. Nevertheless his ^{and} ^{certainly} work makes worthwhile contributions to ~~the~~ experimental physics.

Religious and philosophical pursuits.

No biographical memoir of Ra Venkatesachar would be complete without a reference to his activities in propagating Advaita philosophy. After being a scientist during the first half of his career he was an Acharya in the real sense of the term during the second half from 1946 to 1972. Even while he was a Professor in the Central College, he took keen interest in Sanskrit, and was the President of the Sanskrit Association of the College. ~~He~~ ~~turns~~ ~~to~~ ~~his~~ ~~scientific~~ ~~outlook~~, ~~he~~ ~~was~~ ~~able~~ ~~to~~. He made a deep study of several facets of Indian philosophy, the Advaita of ~~Shankara~~ Shankara Charya.

the Vishitadvaita of Ramanya, and specially the Dvaita of Madhvacharya of which whose sect he was a devout follower. He was responsible for the founding of several Sanghas in Mashwa Sanghas in the State, and earned the great regard of several Heads of the Mashwa Mutt. Sri Pejawar Swami who founded the Purna Pragna Vidya Peeth appointed him Vice-Chancellor of this Institution. He arranged several seminars and symposia devoted to the Vedas, the Upanishads, and the Bhagavad Gita in which many learned men participated, and he himself took a keen interest in these activities by initiating the discussions. The number of scholars who benefitted by these activities is legion, and they always remember his initiative, and creative contributions in this direction. He was himself the author of ~~some~~ several treatises and lecture notes numbering nearly 50. ^{samples of these published in English} ~~As far as we might mention~~ his works on Dvaita Vedanta and life, Sri Madhvacharya saw his Message, the Monism of Shankara, the nature of Para Brahman as depicted in the Gita, the genius of Jayatilka as a commentator of Dvaita Philosophy, Vedanta and Modern Science, and Religion and Life. ~~and~~ This memoir is perhaps not the proper forum to deal with his other ~~innumerable~~ numerous contributions to religious and philosophical topics, and the very active and dynamic part he took in propagating Dvaita philosophy.

As a recognition of his great services in this direction, the Head of the Vyasaraya Mutt conferred on him the title of "Sachasthra Pravachana Ratna", the Head of the Raghavendra Mutt the title of "Vidyavachaspati", the Head of the Bhandarkeri Mutt the title of "Mashwa Bhurkane", and the Head of the Pejawar Mutt the title of "Sashtra Mishri".

Having earned so many honours in the fields of religion, philosophy and science, he lived a ~~long~~ long happy life of 93 years, and was laid to his eternal rest on 27th May 1972. Great tributes were paid to him many of

friends, students and admirers. As a sample we might give an extract of his the condolence message of ~~Rajaji~~ C. Rajappalachari.

"It was sad news that I read. Venkatesachar was my classmate and was much better in ~~the class~~ his studies than I was. Both of us were of the same age. I followed his brilliant career without personal contact, and was very glad to note it. He was a pious devotee of the Maohwa philosophy and set an example ^{of} godly living with science up to the brim in his head. My condolences to the family and my best wishes to them all."

I wish to acknowledge with thanks the help rendered by Mr. B. V. Rajharendra Rao, the eldest son of the late Rao Bahadur Venkatesachar in supplying me with numerous details which ~~has~~ have helped me in writing this biographical memoir.

B. S. Madhavarao

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Bibliography.

- 1921 (1) (with E. P. Meekalfe) - on the absorption of light by electrically
luminescent mercury - Proc. Roy. Soc. A, 100, p. 149.
- 1924 (2) (with E. P. Meekalfe) - on selective absorption by luminous mercury
vapour - Proc. Roy. Soc. A, 105, p. 520.
- 1925 (3) - on the influence of the length of the radiating column on the width
of spectral lines - Phil. Mag. Vol. XLIX, Jan, 1925, p. 33.
- 1927 (4) Density of the vapour in the mercury arc and the relative
intensities of the radiated spectral lines with special reference to
the forbidden line 2270 - Proc. Roy. Soc. A, 117, p. 12.
- 1929 (5) (with L. Sivaraja) - The spectrum of the mercury arc in atmospheres
of foreign gases - Ind. J. Phys., 4, Pt. 2, p. 179.
- (with L. Sivaraja) (6) Raman Spectra in atmospheres surrounding metallic arcs
- Nature, 30/11/1929.
- 1930 (7) (with L. Sivaraja) A study of the Raman effect in certain substances with a
new apparatus - Ind. J. Phys., 1930.
- (8) The fine structure of spectral lines in relation to selective absorption
- Presidential Address, Phys. Sec., Allahabad, 1930. pp. 1-39.
- (9) (with L. Sivaraja) - The hyperfine structure of certain mercury
lines hitherto not analysed - Half Yearly J. Mys. Univ., 5, p. 145.
- 1931 (10) (with T. S. Subbaraya) - Beitrag zur Analyse der ersten
Funkenspektrums von Quecksilber - Zs. f. Phys., Bd. 5, Heft. 6.
- 1932 (11) Hyperfine structure und selektive Absorption -
- Zs. f. Phys., 75, p. 676.
- (12) Hyperfine structure and isotopes - Curr. Sci., Vol. 1,
No. 5, p. 120.
- (13) (with T. S. Subbaraya) - Nuclear structure - Curr. Sci., Vol. 1,
No. 1, July 1932.

- 1933 (15) (with T. S. Subbaraya) - Neutronen und magnetische Kernmomente - Zs. f. Phys. Bd. 85, Heft 3 und 4.
- (14) Bemerkungen zu der Arbeit von H. Schültr und H. Westmeyer - Zs. f. Phys., Bd. 83, p. 275.
- (16) The magnetic moment of the nucleus - Curr. Sci, Vol 1, No. 8, p. 232
- (17) (with L. Sibaia) - Hyperfine structure of elements in mercury arc - I - Curr. Sci, Vol 1, No. 9, p. 264
- (18) (with L. Sibaia) - Hyperfine structure of elements in mercury arc - II - Curr. Sci, Vol 1, No. 10, p. 303
- (19) Light source in hyperfine structure work - Curr. Sci, 2, No. 1, p. 15
- 1934 (20) (with L. Sibaia) - Hyperfine structure of some Hg II lines - Proc. Ind. Acad. Sci, Vol 1, No. 1, p. 8
- 1935 (21) - (with L. Sibaia) - Platinum isotopes and their nuclear spin - Proc. Ind. Acad. Sci, Vol 1, No. 12, p. 953
- (22) - (with L. Sibaia) - Isotope abundance in platinum - Proc. Ind. Acad. Sci, Vol 2, No. 1, p. 101
- (23) - (with L. Sibaia) - Iridium isotopes and their nuclear spin - Curr. Sci., 1935.
- (24) - (with L. Sibaia) - Iridium isotopes and their nuclear spin - Proc. Ind. Acad. Sci Vol 2, No. 2, p. 203
- (25) Structure of the nucleus - Curr. Sci, Vol 3, No. 9, pp. 407-409
- (26) Some recent work on isotopes and hyperfine structure of spectral lines - Curr. Sci. Vol 4, No. 4, pp. 220-24