

American Association for the Advancement of Science



This is to certify that

Sir K. S. Krishnan

was elected a

FELLOW

of the American Association for the Advancement of Science,

in testimony whereof

the President and the Executive Officer

have hereunto set their hands and the seal of the Association

this First *day of* June *, 19* 60.

William D. Drake

President

Daal Waefle

Executive Officer

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

Shanti Swarup Bhatnagar Memorial Award for Scientific Research

FIRST AWARD

CITATION

In memory of the late Dr Shanti Swarup Bhatnagar, the Council of Scientific and Industrial Research instituted in 1957 an annual award of the value of Rs 10,000/- to be given to an Indian Scientist for conspicuously important contribution in any field of science during five years preceding the award. The Governing Body of the Council of Scientific and Industrial Research decided to make the first award to Dr K.S. Krishnan, F.R.S.

In the years immediately preceding the award, Dr Krishnan has carried out valuable researches in crystal physics, thermionics of metals and semi-conductors, and generally in the physics of the solid state. His work on the thermionic constants of metals and semi-conductors and on the lattice dynamics of ionic crystals are of fundamental significance.

Dr Krishnan's investigations on the distribution of temperature along filaments and tubes electrically heated in vacuo, have brought orderly thinking into a complex, but practical, subject, and made the way smooth for further advances in the field.

Dr Krishnan's researches are characterised by a combination of theoretical and experimental methods of approach, thoroughness and maturity of treatment, and elegance in the presentation of results.

As the Senior Vice-President of the International Council of Scientific Unions he took a leading part in organizing the International Geophysical Year Programme.

A scholar of distinction, well versed in classics, Dr Krishnan attaches importance to the humanistic values of science, and the place of science in liberal education.



Bhatnagar Memorial Award Presented to Dr. Krishnan

Shri Jawaharlal Nehru, Prime Minister, and President, CSIR, presented the Shanti Swarup Bhatnagar Memorial Award to Dr. K. S. Krishnan, F. R. S., Director, NPL, New Delhi at a special function held at NPL, New Delhi on March 24, 1961. The function was attended by the Vice-President, CSIR, and distinguished scientists and industrialists.

Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs and Vice-President, CSIR, in his opening address referred to the invaluable service rendered by Dr. Krishnan and his band of young scientists to the cause of science in India and added that he was happy that the first Bhatnagar Memorial Award was given to Dr. Krishnan, the eminent scientist.

The citation read out by Shri P.M. Sundaram, Secretary, CSIR, stated as follows :

“Dr. Krishnan has carried out valuable researches in crystal physics, thermionics of metals and semi-conductors, and generally in the physics of the solid state. His work

on the lattice dynamics of ionic crystals is of fundamental significance.

“Dr. Krishnan’s investigations on the distribution of temperature along filaments and tubes electrically heated *in vacuo*, have brought orderly thinking into a complex, but practical, subject, and made the way smooth for further advances in the field.

“Dr. Krishnan’s researches are characterized by a combination of theoretical and experimental methods of approach, thoroughness and maturity of treatment, and elegance in the presentation of results.

“As the Senior Vice-President of the International Council of Scientific Unions he took a leading part in organizing the International Geophysical Year Programme.

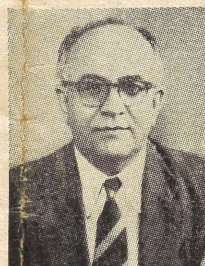
“A scholar of distinction, well versed in classics, Dr. Krishnan attaches importance to the humanistic values of science, and the place of science in liberal education.”

Dr. Krishnan thanked the council for the honour done to him. He

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Prof. M. S. Thacker

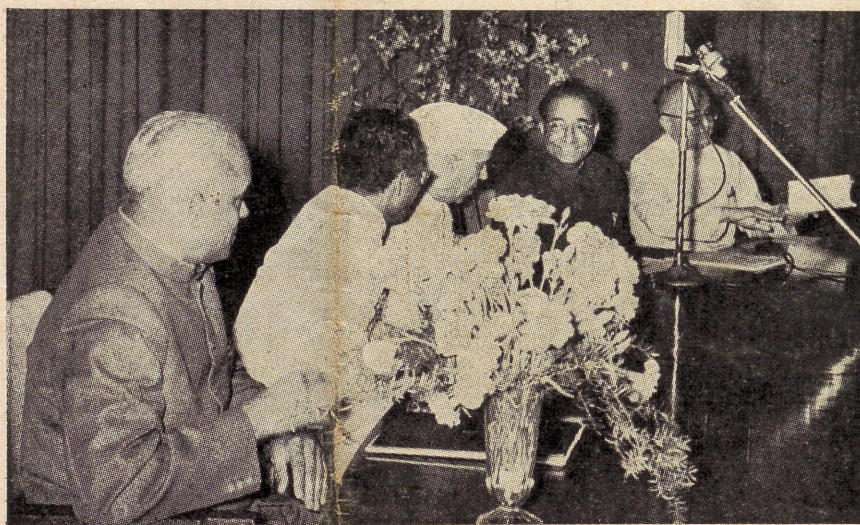
Prof. M. S. Thacker, Secretary, Ministry of Scientific Research & Cultural Affairs and Director-General, Scientific & Industrial Research, left New Delhi on March 26, 1961 on tour to Switzerland, U.K. and U.S.A.



Prof. Thacker will arrive on March 27 at Zurich where he will meet the President, Swiss Foundation for Technical Assistance & Development and complete the formalities in respect of the Swiss assistance for the development of the Central Scientific Instruments Organization. He will reach Boston on April 2. He is one of the special invitees for the Centennial celebration of the Massachusetts Institute of Technology and the international conference which has been arranged. On April 9, Prof. Thacker will be in Washington and visit the National Academy of Sciences and the National Science Foundation and other scientific organizations. He will reach London on April 17. He will have consultations with the Commonwealth Scientific Committee of which he is the elected Chairman and proceed to Paris on April 23. At Paris, he will discuss with the Director-General, Scientific Research, France, regarding pilot plant developments and installations. He will also meet the experts of the French Institute of Petroleum with regard to the collaboration with the Indian Institute of Petroleum. He is expected to return to New Delhi on April 26, 1961.

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Dr. K.S. Krishnan, Director, NPL, New Delhi, will look after the work of the Director-General, Scientific & Industrial Research during Prof. M. S. Thacker’s absence abroad from March 26 to April 25, 1961.



Presentation of the Bhatnagar Memorial Award by the Prime Minister to Dr. K.S. Krishnan

CSIR to take over Central Board of Geophysics

The Board of Scientific & Industrial Research and the Governing Body of the Council of Scientific & Industrial Research met in New Delhi on March 24 and March 25, 1961 respectively. The Prime Minister, Shri Jawaharlal Nehru, presided.

New Institutes, Units and Stations

The Governing Body approved the taking over from the Ministry of Scientific Research & Cultural Affairs the Central Board of Geophysics including its Geophysical and Oceanographic Research Wings with effect from April 1, 1961.

Establishment of Field Research Centres at Ahmedabad, Madras, Sindri and Kanpur and Field Units at Jabalpur and Trivandrum by the Central Public Health Engineering Research Institute, Nagpur, was approved.

Establishment of two sub-stations of the Coal Survey Station, Bilaspur, one at Baikunthapur in Birsampur coalfield and the other in Singrauli coalfield has been sanctioned.

A project for installation and maintenance of 200 wind-mills on the design developed by the Wind Power Division of the National Aeronautical Laboratory, Bangalore was approved.

A scheme for commercial scale cultivation of *Mentha arvensis* (*Podina*) in 2,000 acres of land at Nandpur Farm, Jammu was approved. The scheme will be worked out by the Govt. of Jammu & Kashmir in collaboration with the Central Indian Medicinal Plants Organization.

Pilot Plants

Setting up of following pilot plants was sanctioned: (i) Beneficiation of low-grade manganese ores (capacity, 25-50 tons per day) at the National Metallurgical Laboratory, Jamshedpur; and (ii) Manufacture of methane from animal and vegetable waste (capacity, 1,000 cu. ft/day) at the Central Fuel Research Institute, Jealgora.

Grants-in-aid

The Governing Body sanctioned grants-in-aid to 66 new research schemes (list given on pp. 3 & 4).

Symposia & Seminars

Approval was given to the holding of the following symposia, seminars and conference during 1961-62.

SYMPOSIA

1. *Ferro-alloy Industry in India*—National Metallurgical Laboratory, Jamshedpur.

2. *Cultivation & Utilization of Medicinal Plants in India*—Regional Research Laboratory, Jammu.

3. *Modern Trends in the Drug Therapy of Metabolic Disorders*—Central Drug Research Institute, Lucknow.

4. *Chemicals from Coal and Tar*—Central Fuel Research Institute, Jealgora.

5. *Mechanization of Mines in India*—Central Mining Research Station, Dhanbad.

6, 7 & 8. *Industrial Trade Wastes: Training of Public Health Engineers; and Biological Aspects of Water and Sewage Treatment*—Central Public Health Engineering Research Institute, Nagpur.

9. *Present Status of Drug Research in India*—Pharmaceuticals & Drugs Research Committee (to be held at the Central Drug Research Institute, Lucknow).

10. *Chemical Process Designing*—Chemical Research Committee (to be held at the Indian Institute of Science, Bangalore).

11. *Carbohydrates, Cellulose and Cellulose Industries*—Chemical Research Committee (to be held at the Ahmedabad Textile Industry's Research Association, Ahmedabad).

SEMINARS

12. *Electrochemistry* (third seminar)—Central Electrochemical Research Institute, Karaikudi.

13. *Vegetable Tannins*—Central Leather Research Institute, Madras.

14. *Cholera*—Indian Institute for Biochemistry & Experimental Medicine, Calcutta.

15. *Aeronautical Sciences*—National Aeronautical Laboratory, Bangalore.

CONFERENCE

16. *Solid State Physics* (third annual conference)—Physical Research Committee (to be held at Calcutta).

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paid a tribute to the memory of Dr. Shanti Swarup Bhatnagar who, he said, was in a large measure responsible for the rapid growth of public support to science in the country. He then gave a resume of the research work carried out by him and his colleagues on the physics of solid state.

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research congratulated Dr. Krishnan on behalf of the personnel of various laboratories and thanked the President, CSIR and other guests.

PERSONAL

●DRS. N.M. KHANNA & R.N. CHAKRAVARTI have been appointed, on promotion, Senior Scientific Officers: Grade I, CDRI, Lucknow, with effect from Feb. 20, 1961.

●DRS. D.C. DHAR, I.M. CHAK, V.K. MOHAN RAO, R.N. IYER, G.B. SINGH, R.N. SUR, C.L. MADAN, A.C. ROY & SHRI BALAKRISHNA have been appointed, on promotion, Senior Scientific Officers: Grade II, CDRI, Lucknow, with effect from Feb. 20, 1961.

●DR. GOVIND RAI CHOUDHRY, Junior Scientific Officer, NBG, Lucknow, has been appointed, Senior Scientific Officer: Grade II, CDRI, Lucknow, with effect from Feb. 20, 1961.

●SARVASHRI N. SEN & K.P. AGARWAL have been appointed, on promotion, Junior Scientific Officers, CDRI, Lucknow, with effect from Feb. 20, 1961.

●SHRI R.N. CHAKRABARTY has joined BITM, Calcutta, as Junior Technical Officer, with effect from March 1, 1961.

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●DR. K.S. KRISHNAN, Director, NPL, New Delhi, has been renominated a member of the Standing Advisory Board for Astronomy, Ministry of Transport and Communications, New Delhi for three years.

●DR. B. MUKERJI, Director, CDRI, Lucknow, has been nominated a member of the Editorial Board, *Indian Journal of Physiology and Pharmacology*, Bombay.

●DR. K. N. SINHA, Officer-on-Special Duty, CMRS, Dhanbad, or his nominee will represent the CMRS on the Advisory Committee on Stowing, Ministry of Steel, Mines and Fuel, New Delhi.

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

Nitrogen Instability and Rank of Coal—Investigations have been undertaken for establishing a relationship between the instability of nitrogen and the rank of coal. The instability factor is determined by evaluating the percentage of nitrogen evolved as ammonia to total nitrogen in coal (on dry basis). The instability factors of coals of different ranks were determined and plotted against the percentage of carbon. The graph showed that up to 86 per cent carbon content there is a gradual fall in the instability, after which it does not vary appreciably with the rank of coal. A maximum stability of 94 per cent nitrogen during pyrolysis is observed in coal with 86 per cent carbon.

On plotting the instability factor against the percentage of hydrogen, it is found that while the instability falls with increase in the percentage of hydrogen in lower rank coals (carbon, up to 86 per cent), it is fairly independent of the hydrogen content in higher rank coals—**C. CHATTERJEE, A. K. GUPTA & S. GUPTA.**

CFTRI, MYSORE

Carotenoid Pigments of Badami Mango—Absorption spectral studies have shown that considerable amount of carotenoid pigment, a rich source of β -carotene, of Badami mango is lost during canning of pulp and storage of canned product. Study carried out for the preservation of pulp pigment during processing has indicated that after partial neutralization of the acidity it can be utilized for the preparation of strained mango pulp and drum-dried mango custard powder. The colour of the canned pulp and custard powder is also not significantly affected during processing.

CRRI, NEW DELHI

Thixotropy of Indian Clays—Preliminary investigations have indicated exhibition of the phenomenon of thixotropy by certain Indian clays and silts. According to this phenomenon, remoulded samples of soils or silts gain strength with the lapse of time or by storage at unaltered moisture content.

The thixotropic effects are marked at high liquidity index of soil. Kaolin is the least thixotropic of the clays. But certain soils which do not exhibit thixotropy when treated

with dilute solution of dispersing agents exhibit thixotropy.

Soils compacted at optimum moisture do not exhibit high thixotropy, but when the soils are under low strain, thixotropic effect is significant.

CDRI, LUCKNOW

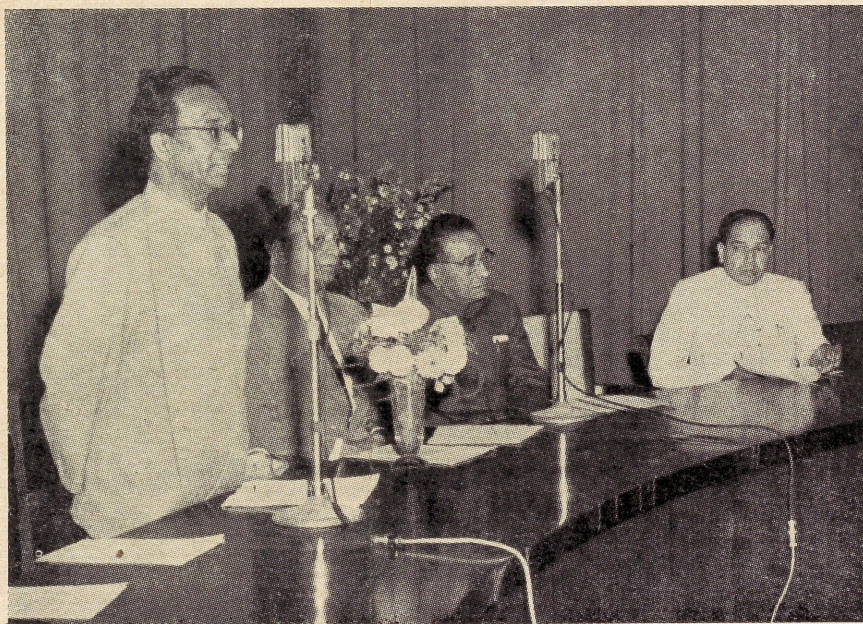
Yeast Hydrolysate from Distillery Sludge—The nutritive value of yeast hydrolysate prepared from distillery sludge has been assessed by supplementation experiments using growing rats reared on a poor rice diet. Growth data and histopathological examination of livers indicate that besides supplementing the growth of rats on the poor rice diet, the yeast hydrolysate partially prevents histopathological changes in the liver of the animals receiving only poor rice diet.

Unesco Seminar on Scientific Documentation

A seminar on Scientific Documentation in South and South East Asia, sponsored by Unesco, was held at Insdoc, NPL Buildings, New Delhi during March 7-16, 1961. The seminar was inaugurated by Prof. Humayun Kabir, Minister for Scientific Research and Cultural Affairs. Shri P.N. Kirpal, Secretary, Ministry of Education, welcomed the participants from India and the following countries: U. S. A., U. S. S. R., France, Japan, Burma, Ceylon, Federation of Malaya, Indonesia, Mexico, Philippines, Singapore, South Korea, Thailand, U.A.R., Nepal and Pakistan. Papers connected with the following aspects of scientific documentation were discussed at the seminar:

1. Position of scientific documentation in Asian countries
2. Techniques and principles of scientific documentation
3. Cooperation in scientific documentation between countries in South and South East Asia as well as other countries.

At the concluding session, proposals for the development and improvement of scientific documentation in the countries of South and South East Asia were considered and unanimously approved.



INSDOC, NEW DELHI—Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs, delivering the inaugural address at the Unesco Seminar on Scientific Documentation

B R I E F S

Agreement for Indo-Swiss Training Centre Signed

An agreement has been signed between the Swiss Foundation for Technical Assistance, Zurich and the Council of Scientific & Industrial Research for the establishment and operation of an Indo-Swiss Centre for training precision mechanics in the field of instrumentation. The Centre will function as part of the Central Scientific Instruments Organization.

Under the terms of the Agreement, the Swiss Foundation will provide free of cost to the CSIR, equipment worth about one and a half million Swiss francs and experts for a period of five to eight years. The total cost of this assistance will be about six million Swiss francs. The CSIR will be responsible for providing the building and necessary supplementary equipment and for meeting the recurring expenditure of the Centre and the local cost of the experts.

Shri P. M. Sundaram, Secretary, Council of Scientific & Industrial Research and Dr. Fritz Real, Director of the Swiss Foundation for Technical Assistance signed the agreement on behalf of the CSIR and the Swiss Foundation respectively. Prof. M. S. Thacker, Director-General, Scientific & Industrial Research and Dr. Schindler, President of the Swiss Foundation will sign the agreement at Zurich.

Symposium on Light Metal Industry in India

The symposium on Light Metal Industry in India organized by the National Metallurgical Laboratory (NML), Jamshedpur during Feb. 14-17, 1961 was inaugurated by Prof. M. S. Thacker, Director-General, Scientific & Industrial Research. Shri Jehangir Ghandy, Chairman of the Executive Council, NML, presided.

Twenty-seven papers received from scientists, engineers and metallurgists from India and abroad, and covering the various aspects of research and development in light metal and alloys, their production and properties were presented and discussed in six technical sessions. The subjects largely covered by the



CSIR SECRETARIAT, NEW DELHI—Signing of agreement for Indo-Swiss Centre for training precision mechanics in instrumentation

papers related to (i) scope for research and development of light metals, (ii) studies and development on reduction and working of aluminium and its alloys, (iii) application of light metals, and (iv) some fundamental aspects of light alloys.

Dr B. R. Nijhawan, Director, NML, in welcoming the delegates, referred to the wide spectrum ranging from laboratory scale experiments to organized pilot plant scale production between research and development in light metal industry and described the role of NML in bringing about a vital link between these two ends of the spectrum.

Shri Jehangir Ghandy, in his presidential address, commended the good work done by the NML in the metallurgy of light metals and formulation of light metals and their alloys based on indigenous alloying elements such as aluminium, magnesium, and rare earth metals.

Prof. M.S. Thacker, in his inaugural address, stressed the need for comprehensive planning to raise the economy and standards and pleaded that serious thought should be given to integrate the survey of all the resources available in India.

Seminar on Fruit and Vegetable Preservation

The Central Food Technological Research Institute (CFTRI), Mysore participated in a seminar on Fruit and Vegetable Preservation organized

at the Institute by the Indian Agricultural Research Institute during Feb. 13-16, 1961.

Of the 24 papers presented and discussed at the seminar, 10 were contributed by the staff of the CFTRI. Some of the important subjects discussed at the seminar are: Development and future scope of fruit and vegetable preservation industry in India, utilization of horticultural produce, storage and transport of fresh fruits and vegetables, processing techniques, quality control, export of preserved fruit products, preservatives, additives and colours, and fabrication of equipment and containers for the industry.

Research Papers

Use of sub-standard fuels in the iron and steel industry—M. S. Iyengar, CFRI, Jealgora, *J. Mines Metals Fuels*, 9 (1) (1961), 1-3.

Unsaturation in coal—J.N. Bhau-mik, A. Lahiri & P. N. Mukherjee, CFRI, Jealgora. *Chem. & Ind.*, (1960), 1998-1999.

Study of flow properties of some Indian china clays—S. Sen & S.K. Guha, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, 19 (1960), 87-97.

Optical absorption spectra of solari-zed Mn^{2+} and V^{2+} ions in glass—S. Kumar & Purabi Sen, CGCRI, Calcutta. *J. Soc. Glass Tech.*, 1, (1960), 165-180.