OBITUARY

DR. HEMENDRA KUMAR SEN

BY the death of Hemendra Kumar Sen at the comparatively early age of fifty-six, India has lost one of her foremost men of science whos econtributions to chemistry, both pure and applied, have been many and varied and whose name and fame as a teacher of chemistry had spread throughout the length and breadth of this sub-continent.

Sen was born at Noorpur, district Faridpore, on the 24th of December 1889. His ancestral home was at Baldhara in the Dacca district. He had his early education at Brahmanbaria, where his father, the late Prasannakumar Sen, was a Deputy Inspector of Schools. After passing the Entrance examination in 1904, he came to Calcutta and joined the City College and here he met his life-long friend, Dr. Bimanbehari Dey, now Director of Public Instruction, Madras.

After graduation in 1908, Sen joined the M.A. classes in chemistry at the Presidency College, Calcutta. Here he came under the influence of the late Sir P. C. Ray who, as is well known, had an almost uncanny instinct for detecting latent merit. He took very kindly to the young student and the latter in his turn cherished a life-long warm affection akin almost to filial piety, for his revered *Guru*.

Sen appeared in the M.A. examination in 1910 but by a cruel irony of fate, failed in the practical examination as he could not carry out a complete analysis of type metal in course of a single day! He passed with a First Class in 1911 and secured in the following year the Premchand Roychand Studentship, the highest distinction to which an Indian student can aspire.

During his college days, Sen had a hard and bitter struggle with poverty. He used to maintain himself by giving private lessons and for some time even lived with Sir P. C. Ray in his former residence at the office and factory of the Bengal Chemical and Pharmaceutical Works, Ltd., at 91, Upper Circular Road, adjoining the compound of the present University College of Science. He had only a single change of clothing at the time and he made his books do duty as pillow by night. Sen was never tired of relating that when Sir P. C. Ray came to know that he was finding it difficult to raise the modest sum of rupees thirty-two, the fees for the Premchand Roychand Studentship examination, he paid the sum himself unasked.

In 1912, Sen proceeded to England to join the Imperial College, London, and here he devoted himself wholeheartedly to Organic Chemistry. It may be mentioned in passing that Sen was extraordinarily versatile. He was at home alike in the domains of Organic, Inorganic and Physical Chemistry and also one of the pioneers of Bio-chemical studies in India. His earliest contribution to chemical literature was a paper, jointly with Dey, on the estimation of nitrite nitrogen by the action of hydrazine sulphate (*Zeitsch. Anorg. Chem.*, 1911, 71, 236). While working at the Imperial College under the late Professor Jocelyn Thorpe, he published a paper on the condensation of ketones with phenols (*J.C.S.*, 1914, 105, 339) and another on the formation of heterocyclic compounds from cyanacetamide and hydroxymethylene-ketones (*J.C.S.*, 1915, 107, 1347). The second paper, which formed part of his thesis for the Doctorate in Science of the University of London, contained an elegant method for the synthesis of quinoline derivatives, which has found its way into standard text-books on Organic Chemistry like Meyer-Jacobson. He was using the surname Sen-Gupta at the time.

Sen returned to India in 1915 and in 1916 he joined the Tata Iron and Steel Works at Sakchi where, however, he spent only a few months. Later, he proceeded to Rangoon and worked for some time as the Chief Chemist at the chemical works of Messrs. Jamal Brothers and subsequently at the chemical works of De Souza and Company. At Rangoon he met his future wife Miss Kalpanarani Sen, daughter of the late Mr. N. C. Sen and grand-daughter of the late poet Nabin Chandra Sen, whose name is a household word in Bengal. The marriage was solemnised in 1917 but in 1920, after only three years of a very happy married life, Mrs. Sen died in child-bed.

Life at Rangoon became distasteful after this sad event so that when the late Sir Asutosh Mukherjee offered Sen the newly created chair of Applied Chemistry and called upon him to organise the department, he readily agreed. He joined the University College of Science in 1920 and it was only then that I came to know him though I had met him casually once or twice before his departure for Rangoon.

At the College of Science, where Sen spent sixteen best years of his life, he applied himself to his task with zeal and a singular devotion which stands unparalleled in the history of this Institution. He used to work long hours and often late into the night. No wonder that within a short time he gathered round himself a band of enthusiastic and devoted students, many of whom are now filling responsible positions very creditably.

Sen was by nature impetuous and he had a hearty disregard of red-tape, especially in matters appertaining to his own department. As a consequence, he had occasional clashes about questions of procedure with the University authorities. The latter, however, were always ready to stretch a point in his favour and overlook the irregularities which became less and less frequent as years rolled on.

In the lecture hall also Sen was unconventional, delivering his class lectures scarcely according to the prescribed routine and very often prolonging the period to two or even three hours. But as the lectures were prepared with meticulous care and contained a wealth of information and were enlivened with anecdotes, they seldom failed to interest the most listless of backbench men. It may be said without exaggeration that Sen was easily

TO OUR CONTRIBUTORS

THE Bangalore Press, our printers, have notified a further enhancement of rates for paper and printing. The Paper Control Order continues to remain in force; the number of contributions to the *Journal* is ever on the increase. It is, therefore, imperative that further economies of space in the *Journal* should be effected.

We wish to solicit most earnestly the co-operation of our contributors in reducing the tables, figures and descriptive matter to the absolute minimum.

EDITOR.

the best speaker on scientific subjects of his time.

In 1922 Sen went to Berlin as Sir Rashbehary Ghosh Travelling Fellow and joined the laboratory of Neuberg at the Kaiser Wilhelm Institut at Dahlem and on his return the following year, he turned his attention to biochemical problems, specially those relating to fermentation. He was a firm believer in the possibility of the extermination of the water hyacinth pest by its biochemical utilisation as a source of power alcohol as well as of potash salts and he devoted many years of patient labour to this problem. It is interesting to note that the very first paper in the *Journal of the Indian Chemical Society*, started in 1924, was one by Sen "on the reduction of unsymmetrical dichlor-acetone by yeast".

Problems relating to the generation and maintenance of high temperatures also occupied much of his time throughout the Science College period. In 1927, he was invited by the University of Patna to deliver a course of Sukhraj Rai Readership lectures. The subject he chose was "High temperature flames and their thermodynamics". The lectures were subsequently published in the form of a book which was 'dedicated to the sacred memory of the late Sir Asutosh Mukherjee, the originator of the Post-Graduate system of studies in the University of Calcutta'.

Sen was particularly interested in glass furnaces and experimented with different types of furnaces as well as burners for atomised liquid fuel, as a result of which, a combination was evolved which appeared to be very promising. With a view to give the system a trial on a manufacturing scale, Sen undertook upon himself heavy financial liabilities by starting a glass factory in the outskirts of Calcutta. Unfortunately, it could not be run properly due to various causes, the chief being the want of sufficient working capital. He lost very heavily and the financial worries consequent thereon continued to trouble him all his life and probably hastened the end.

In 1930, he went to Germany for the second time to attend the World Power Conference at Berlin. It was on this occasion that he met Fraulein Fritzi Emich, a daughter of Professor Emich of Graz, Austria. The acquaintance gradually ripened into love. They were married when Sen went to Germany for the third time in 1933.

Attendance at the World Power Conference brought in its train researches on high pressure electrolysis for which elaborate arrangements were made in the workshops of the applied chemistry department. The researches on biochemical problems were also continued with unabated vigour and a new problem—the low temperature carbonisation of Indian coals—was now added to his repertoire. Sen had a firm faith in the efficacy of always having more than one iron in the fire and acted fully upto it.

In 1936 Sen left the College of Science to join his new post as the Director of the Lac Research Institute at Namkum, Ranchi, and remained there for eight years. After the tumult and bustle of Calcutta, Namkum with its absolute quiet, splendid scenery and vast expanse of field and forest gave Sen the rest and repose that he so sorely needed. Under his able guidance, the Lac Institute whose name as a place of active research was practically unknown even to most of the residents of Ranchi itself, lying five miles away, soon became a centre of vigorous research activity, particularly in the domain of plastics.

Namkum also exercised considerable influence on his character and made him more thoughtful, less impetuous and even more lovable if that could be possible. The people of Ranchi idolised him and he was always sure of a warm welcome wherever he went.

Last year he was prevailed upon by the Government of Bihar to accept the post of Director of Industries. Big schemes of post-war reconstruction, for framing some of which Sen was personally responsible, were in the offing and although the strain of the past few years was beginning to tell on his health, he considered it his duty to shoulder the heavy burden. His new duties combined a large volume of routine office-work with frequent tours, and his friends soon perceived alarming signs of rapid deterioration of his health. In October last when Sen was in Calcutta on a short visit, all his friends advised him to apply for leave and take some rest but this he left unheeded. On the 7th of December he came to Calcutta to solemnise the marriage of his son but soon after his arrival, he had a seribus breakdown. He had to take to his bed immediately but the best efforts of his friends and relatives were of no avail. He died on the 3rd of June 1945.

The death of Hemendrakumar Sen has left a void in the scientific life of India, which it will be difficult to fill. He was one of the Foundation Members of the Indian Chemical Society, of which he was elected President in 1940. He founded the Indian Institute of Chemistry and was its President on two occasions. He was also one of the Foundation Members of the National Institute of Sciences of India. He served on innumerable committees, both of the Government of India and the local Governments, and his advice was eagerly sought for not only by his brother scientists but also by businessmen and industrialists. In the Indian Science Congress, over the Chemistry Section of which he presided in 1927, Sen was a very popular figure. The discussions in which he took part were always lively while his popular lectures always attract ed a full house.

Sen was by nature thoroughly democratic and his intimate friends included many in humbler walks of life. His memory will be long cherished as a treasure by his pupils, relatives and friends.

P. C. MITTER.