OBITUARY

PROFESSOR BIRBAL SAHNI, M.A., D.Sc., Sc.D., F.R.S.

THE news of the sudden death of Professor Birbal Sahni at Lucknow on 10th April 1949, came as an absolute shock to the scientific world; and the loss to India is truly irreparable. It is sad to think that the cruel hand of Death has taken him away from us at the comparatively young age of 58 when he was in the prime of his scientific career, and was looking forward to achieve higher ideals to raise and enhance the prestige and reputation of scientific work in India, and secure for her an honoured place in the international scientific world. The starting of an 'Institute of Palæobotany' in India which would be the first of its kind in the world, and serve as a centre of palæobotanical study and research of the highest order, was Prof. Sahni's life's ambition; during the 30 years of his scientific career, he had kept this objective in view, and dedicated himself entirely to this cause, and was eagerly looking forward to the day when he would be able to realise this ambition. On the 3rd of April 1949 when the Prime Minister of India, Pandit Jawaharlal Nehru, laid the Foundation-Stone of the 'Institute of Palæobotany' at Lucknow, it was indeed a great event in Prof. Sahni's life as the fulfilment of his one great ideal; that he should have been snatched away by Death almost within a week after this event, makes his demise really tragic.

After a brilliant educational career in India, the young Birbal Sahni went abroad for higher studies in Botany, and soon won the highest academic distinctions in his subject in the universities of London and Cambridge. During the latter part of his stay there, he was actively engaged in research and published a number of papers which immediately secured great recognition, and marked him out as one of the outstanding members among the younger botanists of those days. The young Dr. Sahni soon developed a special interest in the study of fossil plants, and naturally joined the famous Cambridge School of Palæobotany under the inspiring leadership of Sir Albert Seward. It did not take very long for the learned professor to discover that in Sahni, he had a most promising and enthusiastic worker who fully deserved his special care and attention; and Sahni soon became one of Steward's 'pet pupils'. Thus was Sahni initiated into the field of Palæobotany; and what he has achieved as a palæobotanist during these 30 years bears eloquent testimony to the manner in which he fulfilled the highest expectations of his eminent teacher. To Sahni, Seward was at all times his 'revered *guru*'.

Prof. Sahni will always be remembered for his outstanding work in the field of Palæobotany, and it is no exaggeration to say that the study of Palæobotany in India on modern lines really started with him. During his stay in Cambridge, Sahni had already published several papers on fossil plants; and one of his best known earlier works was his study of the petrified plant remains from the Queensland Mesozoic and Tertiary Formations, published in 1920. This Australian material really came to Prof. Seward for description; but he passed it on to Sahni with the confidence that the young man would be able to deal with it quite efficiently. When the work was completed and Sahni had prepared his paper, Seward passed it on to the Queensland Geological Survey for publication; and in doing so, wrote as follows: "Prof. Sahni devoted himself with his accustomed thoroughness to the work of describing the plants and to the problems that were raised, and after a perusal of the paper he has furnished I must express my appreciation of the able manner in which the investigation was carried out." Another important paper published by Dr. Sahni also in the same year was the one on "The structure and affinities of *Acmopyle Pancheri*" in the *Transactions of the Royal Society*, in which after giving a detailed account of the monotypic New Caledonian genus *Acmopyle*, he discussed with remarkable lucidity some of the most controversial questions like the systematic position of the Taxineæ, the morphology of the ovuliferous scale of Conifers, and the origin of the Conifers themselves. His resolving the Gymnosperms into two divisions—Phyllosperms and Stachyosperms—is recognised as an important contribution in interpreting the evolutionary relationships of this interesting group.

It was also in the year 1920 that a Memoir on "Indian Gondwana Plants: A Revision" was published in the Palæon-

tologia Indica Series under the joint authorship of Seward and Sahni; and this may be taken as the starting point for the study of Indian fossil floras on modern lines. After imbibing the best traditions of the Cambridge School, and having worked in such close association with Prof. Seward, Dr. Sahni resolved on his return to India to dedicate himself entirely to the study of Indian fossil plants; and this he did with remarkable devotion and conspicuous ability till the last day of his life.

Starting with this idea nearly 30 years ago, the first thing that Sahni did naturally was to take stock, as it were, of the existing position of Indian Palæobotany, and visualise the possibilities of further work. This he did in 1922 in his Presidential Address to the Botany Section of the Indian Science Congress on "The present position of Indian Palæobotany". In the course of this address he said: "My own interest in palæobotany raises the hope that I may help to bring this fascinating subject more prominently to the notice of my countrymen; and perhaps even succeed in inducing a large number of them to turn their attention to the rich field that it offers for original investigation. With this end in view I propose to devote my address to a brief review of the present position of Indian Palæobotany". The stream of papers on Indian fossil plants by himself and his students which has continuously flowed from Lucknow during these 30 years shows how fully he had succeeded in realising the hopes which he entertained in 1922. It is hardly possible in the course of this short Note to review and give an account of all this output of research by Sahni and his collaborators; suffice it to say that the Lucknow School of Palæobotany under the inspiring leadership of Prof. Sahni gradually came to be recognised as one of the foremost centres of palæobotanical research, and was looked upon in this part of the world with the same regard and recognition as the Cambridge School under Prof. Seward.

The one important point which Prof. Sahni recognised was that all palæobotanical studies must be made in relation to the geological and geographical conditions under which the plants under investigation lived and died; and that without a proper understanding and appreciation of this geological background, the study of fossil plants loses practically all its vital interest. Thus it happened that Prof. Sahni gradually got more and more interested in geological studies, and he spared no pains in understanding the geological setting of the fossil plant material which he was studying from time to time. This rational line of approach has been most fruitful, and accounts for the very great interest and importance of many of his studies both to the botanist and to the geologist.

A very large amount of work done by Prof. Sahni relates to the study of the Gondwana floras; and in this field, he was an acknowledged authority. Apart from the description and identification of these fossil plants which in itself was a most valuable contribution, he dealt with some of the more fundamental problems connected with the Gondwana floras such as their origin, distribution, evolution, and relationship with the other contemporary floras. Among the more important of such contributions may be mentioned (i) The Southern Fossil Floras, a study in the plant-geography of the past; (ii) Permo-Carboniferous life-provinces, with special reference to India; (iii) Wegener's theory of Continental Drift in the light of palæobotanical evidence; (iv) The relation of the Glossopteris Flora with the Gondwana glaciation; and (v) Recent Advances in Indian Palæobotany. In each of these papers, he has given us a masterly review of the latest position in the light of his own work, and indicated new angles of vision for further studies. His memoir on "*Williamsonia sewardiana* sp. nov. from the Rajmahal Hills," in which he gave an entire reconstruction of one of the first known Indian fossil cycads is recognised as an outstanding contribution from India to our knowledge of this very interesting group of Mesozoic Cycadophyta. Equally important, from the point of view of the vexed problem of the origin of Angiosperms, is his memoir on "*Homoxylon rajmahalense*, gen. et sp. nov. also from the Rajmahal Beds."

From the way in which Prof. Sahni approached the study of fossil plants, it was only natural that many of the results of his work had an important bearing on several geological problems. His work on the flora from the Deccan intertrappean beds of the Nagpur-Chhindwara area and their age indications led to the famous controversy regarding the age of the Deccan

Traps. After about four years of discussion from all points of view, Prof. Sahni's contention, on the evidence of his fossil plants that the Traps are really Eocene and not Upper Cretaceous, has been generally accepted. A most comprehensive and fascinating account of this work was given by Sahni himself in his General Presidential Address to the Indian Science Congress in 1940. His latest work on the discovery of micro-fossils in the salt marl and associated beds of the Punjab Salt Range and their bearing on the 60-year old controversy regarding the age of this 'Saline Series,' is well known; and the Proceedings of the two Symposia on this subject held in 1944 and 1945 in which practically all the leading workers in this field both in India and outside have participated, bear ample evidence to the manner in which Sahni's work has stimulated worldwide interest as offering a conclusive solution to what has been a most intriguing and tantalising problem.

To one who was thus devoting all his time and attention to scientific research and was making several notable advances in our knowledge, it was only natural that the highest honours and distinctions in the scientific world came to be conferred upon him in quick succession from time to time. Prof. Sahni was a Foundation Member of many of the scientific bodies in India, and always played a most effective part in promoting and upholding the highest traditions of scientific research in this country. He frequently went abroad in response to invitations for participating in congresses and conferences concerned with palæobotany; only a few days before his death, he was elected as the President of the International Botanical Congress to be shortly held at Stockholm,—but, alas, he has not lived to occupy that Presidential Chair which, we are sure, he would have done with outstanding ability and distinction, adding to India's glory in the international scientific world.

As a scientist, Prof. Sahni was known for his thoroughness in looking into every detail of the investigation; and whether it was his own work or that of others, he insisted on being satisfied on every point of observation, illustration, or discussion, before he would pass it for publication. What he said of another eminent palæobotanist is equally true of himself: "Like all cautious workers, he was difficult to convince....but was by no means of the type that clings to pet theories". For clarity of presentation, lucidity of argument, and due consideration for the 'other point of view', Prof. Sahni's papers are a model for others to follow. A great feature of Dr. Sahni's work as a man of science, was that apart from his own personal investigations, he had organised a School of Research at Lucknow where a team of young and enthusiastic students had gathered round him and carried out original work of the highest order under his personal care and attention. Every worker in the field of palæobotany and allied subjects in India looked up to him, at some time or other, for help and guidance. Singularly free from all passions and prejudices, personal or provincial, Prof. Sahni gave of his best to every one of these workers promptly and generously; and all of them recall with regard and affection the many acts of kindness which they have received at his hands.

Apart from the greatness of his accomplishments as a scientist, Dr. Sahni's human qualities of kindliness and friendship were really unique. Belonging to a noble and highly cultured family, he possessed a most amiable and charming personality, and endeared himself to one and all alike. To see him, was to like him; to know him, was to love him. Those that had the privilege of enjoying the genial hospitality of the Sahnis at Lucknow know how fondly they were attached to each other, and had built up for themselves a home with an all-pervading atmosphere of peace, happiness, affection, and goodwill.

The late Prof. Sahni has left behind him a glorious record of scientific work; and by his untiring endeavours, he has laid the foundations for the study of Indian palæobotany truly and well. The 'Institute of Palæobotany' which will grow up in Lucknow will live for ever as a fitting monument of his achievements and aspirations in the cause of Palæobotany, and serve as a perpetual source of inspiration to workers from all parts of the world in this fruitful and fascinating field of study and research which he so richly adorned.

L. RAMA RAO.