

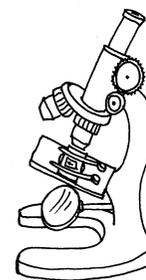
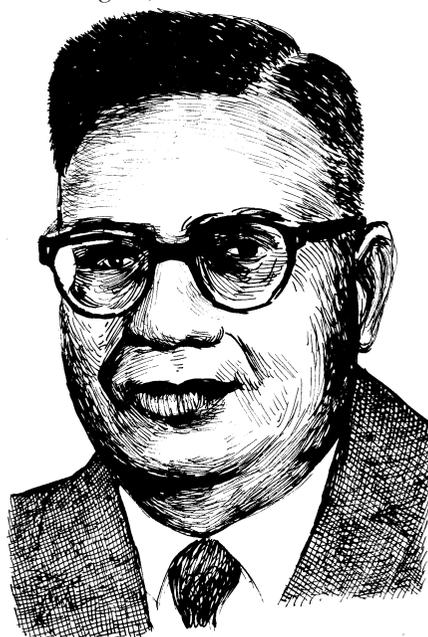
P. Maheshwari

(1904 – 1966)

Prof. Panchanan Maheshwari was a legendary scientist who did India proud by placing it on the world botanical map. He was born in Jaipur on 9 November 1904. The word *Panchanan* in Sanskrit means an intellect of *five faces* or people. The appropriateness of the name soon became apparent. His father was a clerk but struggled hard to give his son the best possible education. Panchanan went to school in Jaipur and cleared Matriculation at the age of 13. Because of his weak eyesight he could not take up medicine, but nevertheless he pursued a career in science.

For BSc (1923) he studied at the Ewing Christian College - affiliated to the Allahabad University. Here Maheshwari came under the spell of a remarkable American Missionary teacher, Winfield Scott Dudgeon, a renowned American botanist and founder-President of the Indian Botanical Society. Although students revered him, he was also feared as a hard taskmaster. But in Maheshwari, Dudgeon found a student he had long been looking for.

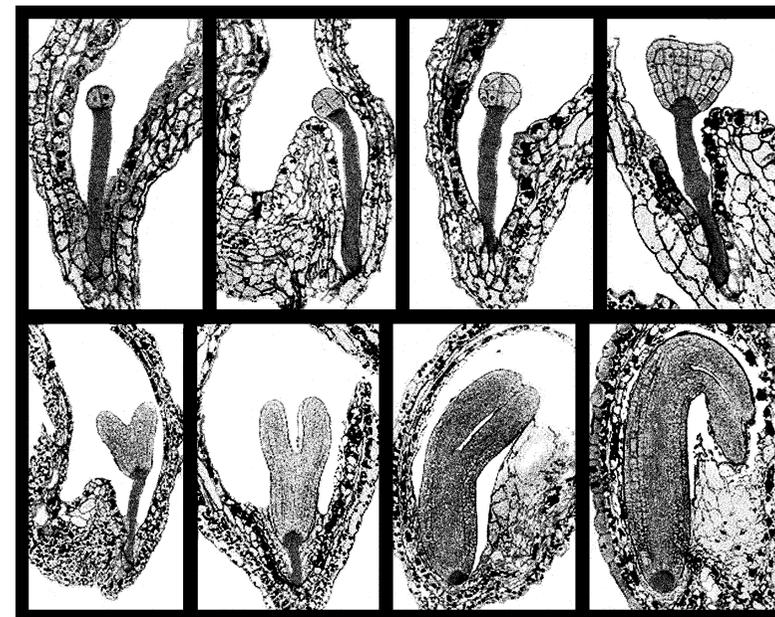
Dudgeon took the young Maheshwari on expeditions to collect botanical specimens and taught him the basic techniques of plant morphology. On one occasion Dudgeon told Maheshwari, *“A Hindu father believes his life’s aim is fulfilled if he has given his son a good education. My son is dead, but I wish to leave behind at least one student who will carry on my mission.”*



Young Maheshwari was exceptional in studies. He did MSc (1927) and DSc (1931) under Dudgeon’s guidance. He studied the morphology, anatomy and embryology of angiosperms - the class of plants which produce flowers. After completing his studies Maheshwari went to his mentor to offer him *guru dakshina*. Quick came the reply, *“Do for your students what I have done for you.”* This message the young man took to heart. Wherever he went thereafter, whether it was Agra, Dacca or Delhi, he tried to do just that.

After joining Agra College in 1931 he immediately set up a school of plant embryology. With meagre resources he acquired a microscope and a microtome. At home his unschooled wife Shanti assisted him in preparing professional slides!

We know that ovules in the flower of a plant fertilize when an insect or wind brings to it pollen from another plant. This occurs in a cavity inside the flower called ‘ovary’ and an embryo is the result. The embryo, the unborn baby plant, gets nutrition and food from the surrounding soil and grows up to become a plant. The way the embryo grows up to become a full-fledged plant differs from species to species. Maheshwari studied this process of growth in several



This sequence of micrographs (not to scale) shows the growth of an embryo of Arabidopsis, from the mustard family.

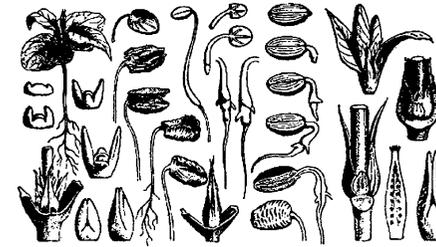
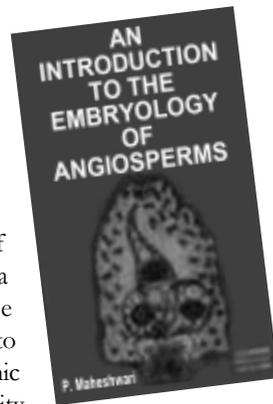
species of angiosperms. He also classified them according to the differences he found in such embryological studies.

In 1936-37 Maheshwari went to Europe and England during which he made many valuable contacts. On returning he worked in Lucknow for a while with the famous palaeobotanist Prof. Birbal Sahni. In 1939 he joined the Dacca University to start a new biology department. There he met many illustrious scientists – Satyendra Nath Bose and Meghnad Saha. He worked in Dacca University for 10 years and established a flourishing school of botany. After partition in 1947 he was requested by authorities in East Pakistan to continue, but just then an irresistible invitation came his way.

In 1949, he was invited by Sir Maurice Gwyer Vice- Chancellor of Delhi University (also the last British Chief-Justice of India) to head the new Department of Botany. This was the most creative and productive period of his career. In the 1950's he was already a name to reckon with. He had amazing personal qualities and a photographic memory. He was forthright, unconventional and had boundless energy. He was an outstanding scholar and teacher whose motto was *Work is worship*. As a perfectionist he set high standards for himself and accepted nothing that was second-rate. His promptness and punctuality were proverbial.

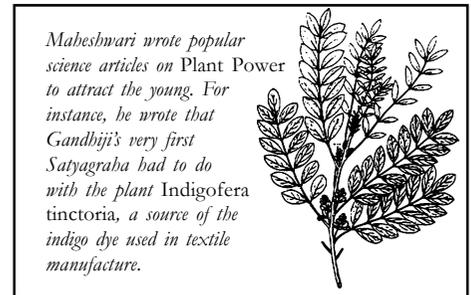
He inspired students to carry out research with low-cost, improvised apparatus. His efforts slowly bore fruit. Soon his department developed and gained recognition abroad. Moreover, several scientists elsewhere became interested and started research in embryology. Maheshwari can well be called the father of modern embryology.

Maheshwari invented the technique of test-tube fertilization of angiosperms. Till then no one thought that flowering plants could be fertilized in test-tubes. This technique accelerated the rate of fertilization by eliminating the dormancy period of a seed. Many more flowering plants could now be crossbred. This technique proved of immense help to plant breeders and opened up new avenues in economic and applied botany. Soon after joining Delhi University he wrote a book *An Introduction to the Embryology of Angiosperms*. This book, considered a classic, has been translated into several languages including Russian. It continues to be cited even 50 years after its publication!



Maheshwari's work embraced almost all branches of botany – and he can be considered among India's last complete botanists. Maheshwari and his students collaborated and investigated over one hundred families of angiosperms! In the process they detected and corrected many dubious errors. *An Illustrated Flora of Delhi* was written under his supervision. This remains an authoritative field-guide for laymen and professionals alike for over half a century.

In 1951, he launched the International Society of Plant Morphologists with the journal named *Phytomorphology*. To foster writing skills amongst the undergraduates, he started *The Botanica*, published by the Delhi University Botanical Society. This magazine was an instant success as it carried lively and informative articles. At the request of the NCERT, he prepared a textbook of biology for higher secondary schools. It contained numerous inspiring examples of the rich Indian flora. Many educationists think this to be Maheshwari's most enduring and seminal contribution.



Maheshwari wrote popular science articles on Plant Power to attract the young. For instance, he wrote that Gandhi's very first Satyagraha had to do with the plant *Indigofera tinctoria*, a source of the indigo dye used in textile manufacture.

In class Maheshwari was like his guru, Dudgeon. His students both loved and feared him. They named many newly discovered species of plants in his honour, like *Panchanania jaipuriensis* and *Isoetes panchananii*. Maheshwari was alone in crusading against Stalin's favourite scientist Trofim Lysenko – a Russian plant breeder who fraudulently advocated the inheritance of acquired characters.

Panchanan Maheshwari was a scientific citizen of the world and many academies felt honoured to make him a Foundation Fellow. In 1934 he became a fellow of the Indian Academy of Sciences, Bangalore. The Indian Botanical Society honoured him with the Birbal Sahni Medal in 1958. He was the General President-elect of the Indian Science Congress Association for 1968, a role he could not fulfil on account of his untimely death on 18 May 1966. He was elected Fellow of the Royal Society in 1966. It was typical of him that he did not disclose this even to his family members. They learnt it later only through newspapers.