

"Raman is an Adjective"

—so said the Nobel laureate speaking of himself
to "The Illustrated Weekly of India"



READING OUT a passage extolling the beauty of cinerarias. Dr Raman's latest research work is in floral colours.



"MANY INDIAN SCIENTISTS are in a deep freeze. They are all carpetbaggers. You know what I mean?"



NEVER MIND KHORANA. "The more Indians go abroad the fewer chances of their winning the Nobel prize."

AS a high-school student I nursed ambitions of becoming a physicist. I had a senior who frequently visited Bangalore and claimed that he and Sir C. V. Raman walked the same streets together. I got jealous. I wrote out a naive theory of solutions and sent a copy to the scientist. That done I waited impatiently for the announcement of the award to me of the Nobel prize. It turned out to be a long wait.

It was some three years later that I saw Raman for the first time. We, at Presidency College, Madras, had invited him to address our Union. I had expected him to look like Acharya P. C. Ray or like Berzelius. Why like Berzelius? It was a name in science that fascinated me greatly. But in his European clothes and turban Raman looked like the diwan of a princely State. I can't recall what he spoke. But I still remember his restlessness. He fidgeted, when our Principal made the welcome speech, and he constantly pressed his palms together, with his fingers interlocked, as if he were about to utter some imprecations. As he spoke he walked up and down the dais, like a caged lion. There was some vehemence in his speech—vehemence about what I don't remember.

That was more than 25 years ago. In Bangalore recently I was excited by the prospect of meeting him. As I walked through a pathway in the gardens of the Raman Institute, lined with hibiscus bushes, I was warned that he would be irritable. But I found him very pleasant. At 81 he

didn't look much different from what he had been nearly a generation before. Turban, face and all were the same. Not "gnarled like a tree", and the eyes as keen as ever. It seemed to me he was more irrepresible than before. He talked on and on, faster than I could note down what he said. He was animated as sodium on water and as corrosive in his comments as sulphuric acid.

In his massive Institute of grey stone he looked a solitary figure like Cavendish who spent a lifetime in his laboratory without stepping out. But Raman is no recluse. He is wide awake to the world, and reacts immediately to everything.

As National Professor of Physics he receives a salary from the Government, varying from year to year. But his Institute has not received any Government aid. "I don't want any money from them," he said. "If I don't take any Government money it is not because I hate the Government, but because I love myself more." He added that human freedom was essential to the development of science and that science was to a large extent the work of individuals.

Floral Colours

At the time of my interview, Raman was absorbed in his experiments on the colours of flowers. An assistant brought him two small bottles—one containing a red liquid and the other a blue liquid. He peered through them and laid them aside. The bottles contained the juice of crushed flowers of cinerarias. He had bought some potted cinerarias from a flower show.

Cinerarias come in two shades, red and blue. Raman's experiment with them had led him to believe that the colours of all flowers, except yellow and orange, were formed by Florachrome A (blue) and Florachrome B (red)—individually or in varying combinations. He seemed to be particularly fond of the cineraria and enthusiastically read out from a book a passage extolling its beauty.

He stopped reading and asked me: "Are you a Travancorean?" He guessed my home State correctly but not the region. "Certainly not," I replied. "I am a Cochinite." (We Cochinites don't like Travancoreans.) He asked me the question because he wanted to tell me about another flower, *santhupushpom* (so called because it resembles the conch-shell). It is sacred to the gods and found in abundance in Kerala. Now this *santhupushpom* is white—or blue like the cineraria. And the blue variety was of interest to Raman.

Richard Willstatter of Germany was awarded the Nobel prize for his work on plant pigments. Sir Robert Robinson, another Nobel laureate, also investigated colours. According to their findings floral colours are due to the presence of anechocyanin. "The chemical view of these two scientists," Raman said, "is false. I am the first scientist in the world to look at a flower through a spectroscope."

Talking of colour he inevitably dwelt upon his theory of vision. He has written a book on it entitled *The Philosophy of Vision*. When asked why he had not sent out

copies of the book to be reviewed, he snapped back: "There is nobody competent to review it. Why should I let myself be barked at?"

Raman said he was a "practical nationalist". He was not interested in getting his books published abroad. Foreign books were too costly, he said. "Don't we have presses in this country, paper in this country?"

I asked about the obvious thing—his work on diamonds. "Diamonds also interest others," he replied. "X-ray topography was invented in Bangalore to reveal the inner variations of crystal structures. The idea came from my study on diamonds. Some of my ideas are too revolutionary. You know what I mean?"

This "you know what I mean" was characteristic of him, and sometimes when I didn't follow an abstruse point he made I was on the verge of saying, "I don't."

I was very *gushe* in putting him one question. "How is it," I asked, "India hasn't

produced any great scientist after you?" (I hadn't of course forgotten Khorana and Chandrasekhar—but they are no longer Indian nationals.)

He was quick to seize upon my clumsy after you. "That makes me feel dead," he said.

He was not very much impressed by the work of Indian scientists. "Many Indian scientists are in a deep freeze. They are all carpetbaggers. You know what I mean? They go to Tokyo, London—they are continuously on the move. They attend conferences. Each scientist gets about ten minutes to speak. That's how they achieve fame."

Indian students who go abroad, he said, "are given the discarded crumbs from the table. The truth is we are far too reliant on what we learn from the West. It is my conviction that that is the reason why India has not made much headway."

He decried "foreign inspiration" and "foreign methods". "We must have the

course of our convictions and the courage to pursue our own ideas."

His own life was an example. Raman was proud that he had won the Nobel prize with work done exclusively in India. As a young man he resigned from the I.A. & A.S. to join Calcutta University, Sir Amutosh Mukerjee, Vice-Chancellor, wanted Raman to go to Cambridge. The young scientist asked Sir Gurudas Banerjee about it. Sir Gurudas said to him: "Tell Sir Amutosh that you are not going abroad. You will bring fame to yourself and glory to India without going abroad." Raman took the advice and the prophecy was fulfilled. "If I had gone to Cambridge, I'd have been like others. The more Indian scientists go abroad, the fewer chances of their winning the Nobel prize. I got my Nobel award for the work done with an apparatus that cost only Rs.200."

A Come-back

That was in 1928 and his discovery was the Raman Effect. He said: "Raman is interested in everything except his own Effect." However he added with obvious relish: "The Raman Effect is a rage now. Infra-red had pushed it into the shade for some time. But, after laser beams, the Raman Effect has staged a come-back." He paused and took out from his files a paper and waved it before me. "Now there is a Raman Newsletter. It is going round the world now."

I asked him if the foreign chemical company which published the newsletter had got his permission to use his name.

"Raman is an adjective—not a noun," he answered.

He was not thrilled by the voyages to the moon. "I've ceased to believe in science as it is done today. The money spent on the moon landings should not have been spent at all. It's a criminal waste..." He stopped and added enigmatically: "It's all right, it's all wrong." He blamed both America and Russia for the waste.

Reads Hardy, Shelley

What books did he read? Raman said he was a lover of Thomas Hardy. He had read some Hardy novels three, four or even five times. Shelley and R. L. Stevenson were other favourites. Literature had not made as great strides as science, I said to myself.

Raman's liking for Hardy is not surprising. For he is a lover of nature. I had mumbled something about his being a part of the Mysore landscape. "You want to see my landscape?" he asked and bade me to follow him. From the balcony of his Institute we had a fine view of the lawns and the trees.

"I am essentially an aesthete," he confessed. Bertrand Russell has said that a great scientist need not necessarily have a scientific outlook. Raman is easily excited by sounds and colours. His early experiments were with musical instruments, and most of his subsequent work has been in the field of physics that comes under the broad head Light. He sometimes sounded bitter. It seemed to me some of his recent scientific ideas had not been accepted by his colleagues.

There was no cloying modesty about him. He was full of egoism—but it was an egoism that didn't bore. Raman can never be a bore. He is vastly interesting.

R. G. K.

VIEWING HIS GARDEN from the balcony of his institute in Bangalore. Dr Raman (81) won the Nobel prize for physics in 1930. (Photograph by B. V. Krishnamurthy)

