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'As a bracelet melts into gold...'

Anita Mehta

Pierre-Gilles de Gennes, the Nobel prize-winning physicist, practised science as many practise art.

— FILE PHOTO: AFP



Pierre-Gilles de Gennes: 1932-2007.

I FIRST met the late Nobel prize-winning physicist Pierre-Gilles de Gennes almost two decades ago, when I was a young post-doc at the Cavendish Laboratory in Cambridge. He'd made an instant impression — the long fingers in repose, the tall frame with its aristocratic features which lit up in welcome of new ideas, the use of "*D'accord*" to convey agreement (despite his perfect English) were different to the point of being almost unnerving in a theoretical physicist. I'd had particular reasons to be nervous; I was trying to make tracks in the desert, so to speak, by researching the physics of sand grains, a field that no one else had yet worked on. Worse and more presumptuous still, I feared, was the fact that I was making pictorial analogies between sandpiles and glass, between sand avalanches and electrical breakdowns, to create a framework within which I could explore the totally mysterious dynamics of sand. I'd expected dismissive remarks at worst or condescension at best, in the face of what could easily have been seen as far-fetched analogies; to my immense surprise de Gennes said, "*Ca j'aime!*" ('I love that!') with a smile that encouraged me more than he realised.

By the time I had met him, de Gennes had already done his Nobel-prize-winning work on liquid crystals and long-chain polymer molecules. He had used the power of analogy

often, to describe unknown and seemingly dissimilar systems in terms of better-known ones — using the equations of superconductivity to describe the alignment of liquid crystal molecules in response to electric fields, or describing the conformation of polymers in terms of random walks that didn't intersect themselves. Scaling arguments — a way of rescaling space to view a system at different lengths, and to describe its universal properties — were frequently used in his work (many examples of which can be found in his seminal book, *Scaling concepts in polymer physics*) and were a signature of his scientific style.

He practised science as many practise art, visualising and sketching, dreaming and extracting the essentials of a natural system, using analogies and making leaps of genius to dream up equations that were as elegant as they were simple, whose predictions rang uncannily true. His work, for example, on liquid crystals led to the huge industry of LCD displays, which are now ubiquitous.

His 1991 Nobel Prize could hardly have found a more worthy recipient — unusually, his breathtakingly large canvas of interests continued to expand even after it, taking in surfactants and surface wetting, cellular adhesion and sandpile dynamics. And true to form, he took his success with style, quoting this translation of a French poem on a soap bubble in his Nobel oration:

Have fun on sea and land,

Unhappy it is to become famous

Richers, honours, false glitters of this world,

All is but soap bubbles'

Educated at the Ecole Normale Supérieure in Paris, de Gennes started his career at the Centre d'Énergie Atomique in Saclay, like the best theoretical physicists of his generation in France. Unlike most of his peers, though, he was driven to cross the Atlantic to work as a post-doc in Berkeley; in later years, he frequently mentioned his huge scientific debt to the years he'd spent in the U.S., and talked about the way they had shaped his physics. One could see why — trained in a rigorously theoretical French tradition, imbued with the imagination which characterises the best scientists, de Gennes needed only the robustness and exhilaration of American science at its best to develop into someone who was as comfortable with abstruse theory, as he was with its creative applications. Soon after his return to France, he was appointed Professor at the elite Collège de France in Paris, where he stayed until he became director of the Ecole de Physique et Chimie Industrielles, Paris.

De Gennes' modesty was legendary — he usually referred to his ideas as 'oversimplified' and 'tentative', and — unusually for a famous scientist — was generous in his praise of those younger than himself. Those of us who have had direct experience of this will always treasure the memories, written and oral, that he has left us with. He straddled many divides with unshakeable grace — between European and American science, between the Grandes Ecoles and the universities in France, between being a very private person and living the public life of a Nobel Laureate, between his work in the sciences and his active interest in the arts, where he was knowledgeable on subjects that ranged from Japanese art to Indian dance *mudras*. His self-deprecating humour was always in evidence; less well known was his private satirisation of the world of science, in a book called *Petit Point*, published in 2003, or the fact that he had acted in a film on Pierre and Marie Curie, or, most importantly perhaps, his self-expression via his sketches, which

many of us will continue to treasure.

In the last years of his life, de Gennes turned his thoughts entirely to the modelling of the human brain; I was privileged to hear him speak at Harvard last year on the subject of associative memory.

He used the example of a rose, whose scent might evoke the memory of its colour, and went on to reason that it took about three neurons to store the memory of an aroma. His lecture was as ever amusing, aesthetic, and vibrant, showing no traces of the cancer he was rumoured to be suffering from; and although he'd looked tired after his talk, most of us had put it down to his customary graciousness in the face of the incessant questions that had followed it.

When I heard of his death (at age 74) on May 18, 2007, I remembered what he was reported to have said at his Nobel banquet, "This is the first and probably the last time in my life where I will have dinner with queens and princesses. I am worried. I suspect that with the chimes of midnight, I will be turned into a pumpkin." I wondered then what had followed the ringing of the final 'chimes of midnight' for Pierre-Gilles de Gennes, and found myself thinking of the words of the *Ashtavakra Gita*:

'From me the world streams out

And in me it dissolves

As a bracelet melts into gold

A pot crumbles into clay

A wave subsides into water.'

No pumpkins in death or in life, I thought; with the death of Pierre-Gilles de Gennes, a bracelet had, indeed, melted into the purest gold.

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