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OBITUARY

Pierre-Gilles de Gennes, Nobel Prize laureate for physics (1991)

Le Monde
22 May 2007

With the death of Pierre-Gilles de Gennes, we mourn the passing of an exceptional physicist. A brilliant mind. A Renaissance man. A man of ideas, of conviction. Always out in the field, never pausing for breath. Wasn't it he who said, "The true point of honour is not to be always right. It is to take risks, to propose new ideas, and then to test them out. And it is also, of course, to be able to publicly acknowledge your mistakes. The honour of a scientist is the absolute opposite of Don Diègue's honour. When you've made a mistake, you have to accept that you will lose face".

To open one's mind. To be receptive. To see science not from "on high", as a vast tapestry, but from "down below", down to the finest detail. Such was the credo of this man, teacher of physics, Doctor of Science, and specialist in condensed matter physics, that the Swedish Academy of Sciences, awarding him the Nobel Prize for physics in 1991, had no doubts in calling him "the Isaac Newton of our time".

He would laugh off such praise, calling it "Nordic lyricism expressed by Swedish academicians". As he reminded us, "Newton had a stature far greater than that of today's scientists. He invented the telescope when he was just 18. At 20, he understood interferential optics and, a few years later, gravitation and planetary motion".

True enough. But, whether he liked it or not, Pierre-Gilles de Gennes was out of the same mould. "He was a physicist who knew other things apart from physics", said Pierre Papon, who taught at the Ecole de Physique et Chimie Industrielles de la Ville de Paris, where de Gennes became director in 1976. "He knew chemistry, he knew biology. I don't know many scientists who have such a wide spread of knowledge that isn't merely a veneer". A comment that the man who became a professor at the Collège de France, in 1971, and a member of the French Academy of Sciences, in 1979, would try to play down. "It's a myth that the research profession is aimed at a small number of mathematically gifted people with a particular psychological profile. Nothing could be further from the truth ... modern science isn't the preserve of child prodigies". Furthermore, "I didn't come up with anything original or personal when I started working in laboratories. I had to bide my time".

But what a career! With Pierre-Gilles de Gennes, science returned to a more human scale. According to Daniel Thoulouze, who was head of the Mathematics and Basic Physics Department at the Centre National de la Recherche Scientifique when de Gennes received the Nobel Prize in 1991: "It is thanks to him that, over the past 20 years, people have realised all over again that physics is a natural science". In fact, de Gennes had no time for intellectual snobbery. His colleagues spoke of his outstanding ability to capture the attention of his public – informed or otherwise – by using simple phrases and trivial phenomena, such as the pool of water that divides into little islands on a sheet of plastic, Indian ink, the rubber boots of Amazon Indians – all stemming from the most complex form of physics.

"The antithesis of a pedant"

We who didn't have a clue about science were turned by Pierre-Gilles de Gennes into physicists, chemists and, we might almost believe, theorists. He would call us to witness, make us part of his team. With twinkling, laughing blue eyes, he looked like a student with his floppy hair, his rather loose jacket, and a scarf round his neck. He would scribble a few things on the blackboard, the inevitable cigarillo dangling from his lips. The spell would work its magic and we were transcended. At least, we thought so.

"What's terrific about him is that when he explains something to you, even if it's a subject you know nothing about, you start feeling clever", said his wife, who, since the early 1990s, has run *Le Boudin Sauvage*, a restaurant a stone's throw from the Orsay site of the Université Paris-Sud 11, and a meeting place for gourmets and scientists. Etienne Guyon, his first student, adds: "I've known quite a few Nobel prize-winners. He was one of the greatest, blessed with a talent for making everything sound simple. The antithesis of a pedant". With a kind of "de Gennes effect", he enchanted us and delighted us. The *Le Monde* columnist, Pierre Georges, went so far as to say: "With him, we're not just talking about phenomenal learning. He is a scientist with charm, a rare breed which has nothing to do with the absent-minded professor or the eternal student. He is someone who you immediately want to be friends with, or whose disciple

you want to be, just to enjoy the unusual privilege of becoming clever for a moment”.

He used this charm to bring together outstanding colleagues and lead them down byways where they were not so much “prophets” as “explorers who were often hesitant and tired”. In fact, Pierre-Gilles de Gennes’ path was rather a meandering one. And it went, invariably, off the beaten track.

Born in Paris in 1932, he spent his childhood in Barcelonnette in the Alpes-de-Haute-Provence. His father died when he was nine, and he was educated at home by his mother until the age of 12. He was taken out of the *lycée* at the end of the fourth year and encouraged to complete his “general knowledge” in the galleries of the Louvre. At the end of the 1950s, aged 23, having completed his studies at the Ecole Normale Supérieure, he researched magnetism in the laboratories of the Commissariat à l’Energie Atomique, at Saclay. But he soon gave this up for “the absolutely extraordinary world of superconductors”, before launching into the study of liquid crystals, “nature’s delicate crystalline phase”, which had been observed for nearly a century.

We are now in 1968. The students are in the streets and de Gennes is in his lab. Within a few months, “we were lucky enough to be able to set up . . . six or seven teams at Orsay which, each working in a specific area, agreed to collaborate on liquid crystals”. With the result that, two years later, France “was a leader in the field. . . I was a sort of busybody in all this”.

A contribution which earned him the distinction of becoming the tenth French physicist to be awarded the Nobel Prize. An exceptional honour, tinged with regret. As he explains: “In 1970, we weren’t brought up to think in terms of applications, to concern ourselves with the industrialisation of processes, and I have to admit that we showed ourselves to be very naïve when it came to protecting our inventions”.

Adieu, then, to royalties from liquid crystal displays, so popular to this day.

This economic misfortune was soon forgotten. Life lay elsewhere, in exploring, and perhaps conquering, new domains. For Pierre-Gilles de Gennes was one of those people who love changing and starting again from scratch, which he did in the 1980s and 1990s. If a sector was stagnating, he would dive in. As he did with soft matter, the intermediate state between solids and liquids which covers everything from adhesives to soap bubbles, colloids and vulcanisation. A formidable challenge which, once again, would allow him to grapple with the uncertainties of experimentation to dissect the complexity of seemingly trivial phenomena. Aged 70, he wasted no time in going back to the drawing board yet again when he joined the Institut Curie. There, he taught himself in what was, for him, the entirely new domain of biology. His particular interests lay in investigating sense of smell and memory.

Exhilarating, enthusiastic, curious about everything, insatiable, de Gennes lived life with amazing gusto. A keen sportsman, he loved climbing in the Alps and kayaking down rivers, until health problems led him towards the less demanding activities of hiking and windsurfing. A lifelong lover of painting and drawing, he divided his final months between scientific articles and sketchbooks, his last great pleasures.

24 October 1932

Born in Paris

1991

Awarded the Nobel Prize for physics

18 May 2007

Died in Orsay, Paris

Jean-François Augereau and Pierre le Hir

Translated from the French by Sarah Delmas