

The Double Helix at 50

Five decades have passed since Watson and Crick discovered the shape of the DNA molecule. That discovery brought them international fame, and brought us a new branch of biology that has fundamentally transformed how we think about life.

Francis Harry Compton Crick was a chatty 36-year-old physicist from Northampton working on a Ph.D. and a second marriage. James Dewey Watson, whose studies took him from birds to viruses to genes, was a precocious 24-year-old from Chicago. Starting in 1951, they worked together to solve the mystery of DNA's shape at the Cavendish Laboratory in Cambridge, racing against brilliant minds around the globe.

On February 28, 1953, they deduced DNA's structure, the famous double helix. Less than two months later, on April 25, 1953, the journal *Nature* published their first paper on the subject, replete with now-classic examples of scientific understatement. "This structure has novel features which are of considerable biological interest," they wrote. "It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material."

Indeed, the double helix explains just how genes are passed on, from cell to cell, generation to generation. The modern science of molecular biology is rooted in the Watson-Crick discovery, and much of today's biotechnology would have been impossible without it.

None of the other scientists associated with major DNA discoveries is remembered as well as Watson and Crick. Who recalls the original discoverer of deoxyribonucleic acid? Does anybody learn in school about the researchers who figured out that DNA—and not cellular protein—carries the genes? These were discoveries of critical importance, without which Watson and Crick would have had nothing to do. (DNA was discovered by Friedrich Miescher, a Swiss chemist, back in 1869. Three scientists at the Rockefeller Institute in New York figured out that DNA is the material of heredity in 1944: Oswald Avery, Maclyn McCarty, and Colin MacLeod.)

So why have the names "Watson and Crick" become etched in our consciousness, and not the names of those others whose discoveries were more fundamental? Part of the explanation is the book that Watson published in 1968, a bestselling memoir that recounted the rivalries, professional and personal, in the DNA race. Further explanation is no doubt the loveliness of the shape Watson and Crick discovered: the double helix, with its sugar-phosphate backbone and its rungs of nucleotide pairs, has become one of the unforgettable icons of science, akin to the old "planetary model" of the atom. And perhaps above all Watson and Crick are almost household names because they showed us just how nature zips together and zips apart the molecule that shapes who we are.

In the last five decades, we have been anticipating a genetic revolution that is really only now beginning. The next five decades will almost certainly take us into an age of medical advances and concomitant moral and political challenges symbolized above all by the simple and elegant double helix.