

## EconoMag

### The Show that demystifies Economics

#### Nobel Prize for Economics – part 1

#### John Nash

by Max Farrington and Michael Hirsch



John Forbes Nash and his wife Alicia both died in a car accident in New Jersey. This could be just another tragic news story, but the man was not like any other: he was one of the brightest mathematicians of the last century. In a tribute to Nash and his work, this week's EconoMag will focus on the Nobel Prize for Economics, which was awarded to Nash in 1994 along with his co-recipients Janos Harsanyi and Reinhard Selten.

John Nash was born on 13<sup>th</sup> June 1928 in the United States, in Bluefield, West Virginia. His father was an electrical engineer, and his mother a Latin teacher. His passion for mathematics began when he read the famous book *Men of Mathematics* by E. T. Bell and first published in 1937. At the time he was just 14 years old and later started studying chemical engineering before finally opting for mathematics.

John Nash graduated from the Carnegie Institute of Technology in 1948 with both a Bachelor's and a Master's of Science specializing in mathematics. One of his professors, Richard Duffin, later wrote about him declaring that he was a genius. To further his education and research in mathematics he chose Princeton over Harvard when the chairman of the mathematics department of Princeton offered him the John. S. Kennedy Fellowship, which convinced Nash that Princeton held him in higher esteem. It was in this university that he would make his greatest achievement in the field of Game theory, the work that made him famous and won him the Nobel Prize.

He earned his PhD in 1950 with a dissertation on non-cooperative games. This concerned the definition and properties of what became known as the Nash Equilibrium, the concept that led to the Nobel Prize in 1994. But what exactly is this concept? It is a solution concept of a non-cooperative game involving two or more players, in which each player is assumed to know the equilibrium strategies of the other players and no player has anything to gain by changing their own strategy. Simply put, it provides a way of predicting what will happen if several people or several institutions are making decisions at the same time, and if the outcome depends on the decisions of the others. The Nash Equilibrium has been applied to analyze all sorts of situations ranging from hostile conflicts such as war and the arms race, to penalty kicks in a football match!

In talking about John Nash we cannot forget that he also had a mental illness that first manifested itself in the form of paranoia, as he apparently believed that all men who wore red ties were part of a communist conspiracy against him. In May 1959, he was diagnosed

with paranoid schizophrenia and throughout the 1960's he spent some time in psychiatric hospitals undergoing treatment. After 1970, however, he never went back into a hospital.

His life and illness were portrayed in a book titled *A Beautiful Mind*, a biography of Nash written by Sylvia Nasar, and which won the National Book Critics Circle Award in 1998. A film of the same name followed in 2001, starring Russell Crowe as the Nobel Prize winner, and who received an Oscar nomination for his performance.