A Beautiful Mind: A Biography of John Forbes Nash, Jr., Winner of the Nobel Prize in Economics, 1994 Study Guide

A Beautiful Mind: A Biography of John Forbes Nash, Jr., Winner of the Nobel Prize in Economics, 1994 by Sylvia Nasar

BOOKRAGS

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Plot Summary

A Beautiful Mind by Sylvia Nasar is the story of John Forbes Nash, Jr., the brilliant mathematician who was awarded the Nobel Prize in economics in 1994. The sad life of this mathematical genius was tainted with episodes of paranoid schizophrenia which basically interrupted a brilliant career as is indicated in the opening pages where he is hospitalized and telling a Harvard Professor visitor how he is receiving signals from outer space. According to Nash, the "aliens" sending the signals are trying to recruit Nash to save the world.

Nash was born in Bluefield, West Virginia to Virginia and John, Sr. The senior Nash worked for Appalachian Power and Virginia was a teacher until her marriage. Daughter Martha had a normal childhood but their son John was a loner. He preferred to stay alone and read or perform experiments rather than take part in sports on interact socially and he was like this most of his life. He wasn't an outstanding student as a youngster. His teachers complained that he wouldn't make the effort.

While attending Bluefield College while still in high school, he decided to be an electrical engineer as his father was. He received a Westinghouse Scholarship and attended the Carnegie Institute of Technology. By his second year there, he had switched to being a math major and was recognized as a genius in mathematics. He went on to graduate school at Princeton University. In the summers, he worked at the Rand Corporation in Santa Monica, California, a consulting position he would keep for four years until he was arrested for indecent exposure.

Nash was interested in games and wrote his thesis developing the Nash equilibrium. He was one of the developers of game theory and would be awarded the Nobel Prize in 1994 for his work in this area.

Everyone recognized Nash's genius, but they considered him strange and socially inept. He would constantly belittle people and play childish pranks which is why he was not well liked, even if he was respected for his genius.

Nash secured a position teaching at the Massachusetts Institute of Technology. He had an affair with Eleanor Stier and fathered his first son, John David Stier, but refused to marry Eleanor. He eventually married Alicia Larde and had his second son, John Charles Martin. But by this time, his mental health had deteriorated and he was hospitalized, diagnosed with paranoid schizophrenia, the first of several hospitalizations.

Nash was never able to teach again. In the following years he spent much of the time roaming the halls of Princeton writing on blackboards. His friends in the field of mathematics supported him as much as they could offering short-term research work when he was well enough to work. In the 1980s, he began to recover and was lucid enough to discuss mathematics. By this time, his son John Charles was hospitalized with schizophrenia.

The reader will find this book interesting, watching the manifestation of the illness in Nash and how he battled with the illness. The book, which is a little technical in places, will hold the reader's interest.

Prologue, Chapters 1-2

Prologue, Chapters 1-2 Summary and Analysis

John Forbes Nash Jr. came from Bluefield, West Virginia. He became well known as a mathematician in 1948. He was considered to be a genius by many and did a lot of work in the areas of game theory and economic rivalry. He was a pioneer in the area of computer architecture and liked science fiction. His genius eventually caused him to slip into madness, beginning in his thirties.

The first signs of his mental deterioration appeared in 1959 as he became a full professor at MIT. He was thirty years of age when he suffered his first episode of paranoid schizophrenia. He quit teaching and became involved in numerology and religious prophecy. He traveled through Europe and America at this time and spent time in the 1970s and 1980s wandering around the Princeton campus scribbling on blackboards. At this time his name became more prominent in academic publications and circles.

Nash seemed to recover some what in the 1990s and was awarded the Nobel Prize.

Chapter One discusses Nash's childhood in Bluefield. His parents married on September 6, 1924. They lived in Bluefield in the coal mining mountains of West Virginia and became Episcopalians. The Nashes were respectable middle classers. John Sr. worked for Appalachian Power and was steadily employed through the Depression. Their son John Forbes Nash, Jr. was born on June 13, 1928 and their daughter Martha was born in 1930.

As a child, John was a loner but curious and always asking questions. He liked to learn on his own and read books. He had few friends and was awkward in social situations. John's teachers complained that he would not make the effort to do his schoolwork. He became interested in mathematics at the age of thirteen when reading Men of Mathematics. After taking courses at Bluefield College, Johnny won a Westinghouse Scholarship to the Carnegie Institute of Technology.

Chapter Two tells of John's years at Carnegie, from 1945 to 1948. He originally planned to be a chemical engineer but changed to mathematics. Nash road the train to Pittsburgh in June 1945. Because he was a loner and socially inept, he was often the center of jokes and pranks. By the end of his second year he had the reputation of being a genius and students would come to him for help. He was disappointed in March 1947 when he didn't score in the top five in the William Putnam Mathematical Competition.

John Nash decided to attend graduate school in mathematics. He decided on Princeton because of the generous fellowship offer. Nash worked at White Oak, Maryland defense project the summer before graduate school.

Chapters 3-5

Chapters 3-5 Summary and Analysis

Nash arrived at Princeton in September 1948. He was twenty years old at the time. At this time, America was lagging behind Europe in the areas of mathematics and physics. Princeton was building its faculty in these areas. The Rockefeller Foundation financing allowed the university to recruit top scholars from Europe.

Chapter Four discusses the department at Princeton. Solomon Lefschetz was chairman of the mathematics department at the time. There were no lectures or tests and grades were arbitrary. The faculty engaged in research and supervised student research. The one requirement was that the students have tea with the faculty every day between three and four. The tea was hosted by Mrs. Lefschetz and the wives of the senior faculty.

Chapter Five tells of Nash's first year at Princeton. He showed up regularly at the teas but his attitude implied he felt superior to others. His classmates didn't remember seeing him with a book but he regularly attended lectures by visiting mathematicians. He always asked a lot of questions. During his first semester, Nash would arrange his morning walk so he could see Albert Einstein taking his morning walk. Eventually, he made an appointment to talk to Einstein.

Nash did not attach himself to any faculty member. This was his way of maintaining his intellectual independence. The professor to whom he was closest was Norman Steenrod. Nash liked to exchange ideas with other students. Other people respected him even if they didn't like him, and he wasn't liked by the entire faculty.

Chapters 6-9

Chapters 6-9 Summary and Analysis

Games were popular at Princeton. Many of the games were brought from Europe by faculty members. Games, like Kriegspiel, were popular with the mathematicians. Nash invented a game of strategy and perfect information. The game was called 'Nash' or 'John' and a fellow student, David Gale, made the board for the game.

Chapter Seven discusses John von Neumann who was considered one of the best mathematicians of the twentieth century. He also worked in physics and economics and studied with Einstein in Berlin. Von Neumann had many accomplishments and publications and was one of the developers of game theory. He was also the top mathematician at the Manhattan Project. He became obsessed with computers at the end of World War II.

Chapter Eight discusses game theory and how the Navy was funding research in the area at Princeton. Von Neumann was one of the first to see the applications of game theory to economics along with Oskar Morgenstern. They co-authored The Theory of Games and Economic Behavior saying that game theory could be applied to economic behavior.

Nash was interested in the topic and wrote a paper entitled "The Bargaining Problem." In the paper, he examined the behavior of two national bargaining agents and how they interacted. He based his analysis on the axiomatic approach. He looked at how the bargain was based on mutual gain and asked how they would split the gain.

Chapters 10-13

Chapters 10-13 Summary and Analysis

In August 1949, Nash asked Albert Tucker to be his thesis advisor. Nash took the summer off after passing his general examinations. That fall he began to experience many intellectual ideas.

Nash met with von Neumann to discuss his ideas regarding game theory. They had opposing views of how people interact and von Neumann rejected Nash's approach. Nash continued thinking about games and developed an equilibrium point that could apply to more than two people and wasn't necessarily a zero-sum game. Fellow student Gale drafted a note of the form later and it appeared in the national Academy of Science monthly proceedings.

This was the basis for the first draft of his thesis which he mailed to Tucker who was in California. Tucker suggested revisions which Nash had to make. His twenty seven page thesis became the famous Nash equilibrium. He made a distinction between cooperative and non-cooperative games. This allowed game theory to be applied to other fields, like economics, political science, and sociology.

There will always be a Nash equilibrium point for every non-cooperative game no matter how many players. Each player anticipates the actions of the other players and makes their choices accordingly.

Equilibrium is a situation in which no player can improve his situation. Nash's theory had a great impact on economics and the social sciences.

Chapter Eleven describes Nash's friendship with Lloyd Shapley which began in 1950, his second year at Princeton. Shapley came from Cambridge, Massachusetts and the son of Harlow Shapley. He graduated from Harvard and spent a year at the RAND Corporation before coming to Princeton. Their friendship cooled within a year and they became and remained life long rivals.

In Chapter Twelve, Nash began to work for the RAND Corporation, in the summer of 1950. While at the think tank, he began to move away from game theory and towards pure mathematics. Much of the work at RAND involved military matters since many of the top mathematicians worked on defense projects in the post World War II era. This was the era of the Cold War and there was a great deal of concern about the Russians having access to United States military secrets.

In Chapter Thirteen, the RAND people apply game theory to military situations. They need the concepts of Nash to be relevant for military situations but Nash did not do much work on game theory while at RAND Shapley did most of RAND's work in the area.

Nash stayed at RAND until the summer of 1954.

Chapter 14-17

Chapter 14-17 Summary and Analysis

Nash wouldn't accept a permanent position at RAND. He wanted to be free to explore mathematics and needed a faculty position to so do. He returned to Princeton to teach calculus while looking for a full time position and performing his own research. But the Korean War began and he worried about being drafted. He returned to Bluefield to talk to the draft board and filed for a deferment. RAND and Princeton claimed that he was irreplaceable because of his work. He didn't immediately secure a deferment but he had a delay until June 30, 1951.

In Chapter Fifteen, Nash found that his dissertation in game theory wasn't helping him secure a top academic position. He began to study the area of manifolds. Nash presented a talk on his work at the International Congress of Mathematics in September 1950. His theorem basically said that it is possible for every manifold to find a part that corresponds to the original object. He also felt that it is possible to express every manifold in the form of a polynomial equation. This paper established Nash as a top mathematician.

Nash had hoped to be offered a position at Princeton but wasn't. He accepted a position at MIT.

In Chapter Sixteen, Nash moved to Boston. He walked to work at MIT, which at this time, was primarily an engineering school. It wasn't as exclusive as Harvard or Princeton but they had a lot of money for funding research. Nash worked with Norbert Wiener, with whom he would discuss his research, and Norman Levinson. The latter would become a role model for Nash.

In Chapter Seventeen, Nash was twenty-three when he began to teach at MIT. Nash taught several graduate courses but mostly undergraduate calculus. At this time, Nash began to adopt the attitudes and mannerisms of other eccentrics. He began to have a second life through his colleague Donald Newman and his friends. He went out to restaurants with the group and attended parties.

Chapter 18 - 20

Chapter 18 - 20 Summary and Analysis

Nash drove across country with his sister Martha and Ruth Hincks during his second summer at RAND. John Milnor traveled with them but drove his own car. Nash, Milnor and Martha rented a small furnished apartment in Santa Monica and Martha found a job in a bakery.

Both Milnor and Nash worked on games that summer at RAND. They worked together on one project. RAND conducted experiments in games to see if the players acted as they predicted. The results led them to be suspicious of the predictive power of game theory. Milnor moved out of the apartment because his relationship with Nash was strained. Nash apparently made some sexual advances toward Milnor.

Chapter Nineteen focuses on the McCarthy era in spring 1953. Several members of the MIT faculty were the subject of FBI investigations. Three mathematics faculty members belonged to a Communist Party cell and were called to testify before the House Un-American Activities Committee. At this time, Nash was more concerned about the draft.

In Chapter Twenty, Nash antagonized a colleague named Warren Ambrose. He didn't like Nash's put downs and pranks and challenged Nash to solve the problem of manifolds. Nash developed a theorem that said if a surface embodies the notion of smoothness, it could be embedded in Euclidean space. This theorem was considered one of the most important pieces of mathematical analysis. It became known as the Nash-Moser Theorem.

In 1953, Nash was considered for a permanent position at MIT. He had friends among the faculty, but he also had enemies.

Chapters 21-25

Chapters 21-25 Summary and Analysis

Between the ages of twenty four and twenty nine, Nash had relationships with three men and had a son by his mistress. He wasn't the loner he had been earlier in life. He was more concerned with the effect other people had on his life than he was with the effect he had on theirs.

Chapter Twenty Two reveals that Nash's infatuations with men were experiments. His first encounter was in summer of 1952, after Martha left Santa Monica. Nash became friends with Ervin Thorson, an aero-space engineer.

In Chapter Twenty Three, Nash meets Eleanor, a nurse who admitted him to a Boston hospital for surgery, and he became involved with her. He was five years younger than she was. Nash kept their affair secret from his colleagues. Eleanor became pregnant. Nash was pleased with the idea of having a child but was not interested in marriage. They had a son, John David Stier, born on June 19, 1953. Nash refused to support her and the baby and when Eleanor lost her job, she had to place the child in foster care, but continued to see Nash. She loved Nash and kept hoping that he would marry her. Their relationship continued until 1956.

Chapter Twenty Four discusses Nash's friendship with Jack Bricker, an MIT graduate student. Nash began playing the board game Lasker with Bricker. They had a relationship on and off for five years until Nash married. Nash introduced Bricker to Eleanor before the birth of his son. Bricker eventually dropped out of graduate school in February 1957 and eventually married. They maintained intermittent correspondence for years until their deaths.

Chapter Twenty Five reveals that RAND revoked Nash's security clearance in summer of 1954. They also cancelled his contract. Nash spent a lot of time walking on the Santa Monica beach. One day he was arrested for indecent exposure in a men's room at Palisades Park. This led to the revocation of his security clearance. The arrest taught Nash an important lesson. He could not do whatever he wanted and still have the career and life styles that he desired.

Chapters 26-29

Chapters 26-29 Summary and Analysis

Alicia Larde had been a student of Nash's. She met him again in the Music Library where she worked as a librarian. Her family had been prominent and wealthy in Central America and then settled in New York City. Alicia developed a crush on John Nash and attracted his attention at the Music Library.

In Chapter Twenty Seven, Nash realized that he needed to marry after the disastrous summer in Santa Monica. He was attracted to Alicia and her background. He first asked her out in July 1955. He was still involved with Bricker and Eleanor when he began a physical relationship with Alicia. Eleanor met with Alicia and told her about he son and her relationship with Nash. This didn't bother Alicia who felt that men have mistresses but marry their social equals. Nash left Cambridge for a one year sabbatical without mentioning marriage.

In Chapter Twenty Eight, Nash spent the summer of 1956 in Seattle, Washington. He was spending the summer at the Institute for Advanced Study along with other well known mathematicians. While he was there, his father called. His sister Martha had found out about his son, John, from Eleanor Stier. His father told him to marry Eleanor since she had a lawyer and wanted to sue for child support. Bricker talked Nash into paying child support before the attorney contacted the university.

In Chapter Twenty Nine, Nash spent the rest of his sabbatical in New York, renting an apartment in Greenwich Village. His parents came to visit him. His father was ill and it was the last time he saw him. He died of a heart attack in September 1956.

Alicia moved to New York while Nash was there. They became engaged and married in February 1957. The marriage took place at St. John's Church in Washington DC where Alicia's parents lived.

Chapters 30 - 32

Chapters 30 - 32 Summary and Analysis

Nash commuted to Princeton's Institute for Advanced Study during his New York stay. He also worked at New York University's Courant Institute of Mathematical Sciences. He began to spend more and more time at NYU and was accepted by the students and faculty there. The people there were doing a lot of work in the area of non-linear differential equations in which Nash was interested because of his work in turbulence.

Courant extended a job offer to Nash who decided to return to MIT because of the tax advantages of living in Massachusetts.

In Chapter Thirty One, Nash and Jurgen Moser become friends and exchange intellectual ideas. Each was interested in the ideas and views of the other.

Alicia found employment as a physics researcher. She and Nash decided to keep their finances separate. They often ate out and attended some kind of event every evening. Most people felt that Alicia had a good effect on Nash.

Nash was now thirty and his future looked very promising, but he was not happy. He had not received offers from Harvard or Princeton and was not yet a full professor. He had not yet won the prestigious Fields Medal which is a top prize in mathematics and the path to an endowed chair at a top university.

In Chapter Thirty Two, Nash is thirty years of age in June 1958 and learns that his most creative years are over. He looked for another project in which to become involved and decided to tackle the problem posed by Riemann's Hypothesis. Others warned him that it was a dangerous topic to tackle.

In July, the Nashes left for Europe. Nash was to present a paper on nonlinear theory at the World Congress of Mathematics in Edinburgh. They purchased a Mercedes and drove through France, Spain, Italy and Belgium. In Antwerp, he bought Alicia a diamond engagement ring as he had always planned to do. They then went to Sweden, England and Scotland.

Chapters 33 - 35

Chapters 33 - 35 Summary and Analysis

In fall 1958, Alicia learned that she was pregnant. Nash was pleased although Alicia would have preferred to wait a few years. Career wise, Nash should have been considered for tenure that winter but he didn't want to stay at MIT. He still wanted to teach at Harvard. The University of Chicago was interested in him but he applied for grant money for a sabbatical to work on research at Princeton and in Paris. At this time, he also lost a lot of money in his investments.

Paul Cohen arrived at MIT that fall and he and Nash became friends.

In Chapter Thirty Four, during January and February, Nash's colleagues notice changes in his behavior. They began to suspect that something was wrong when he talked about aliens from outer space communicating with him through the New York Times. Nash remembered feeling mentally exhaustive at this time and feeling that he was involved with a secret world. His colleagues suspected that he was having a nervous breakdown. Nash declined the offer of a chair at the University of Chicago saying that he was becoming the emperor of Antarctica. He gave some talks to mathematicians and they knew something was wrong because his talks were incoherent.

In Chapter Thirty Five, Alicia and Nash move to West Medford. She was also concerned about Nash's behavior and looked for causes in their everyday life. She began to suspect that he was having a mental breakdown and tried to protect him. Alicia took a job at MIT to try to shield him from other people noticing his condition. She finally began to consult psychiatrists and received conflicting advice.

Nash received tenure at MIT. The department chairman relieved him of his teaching duties for a semester hoping that his condition would improve. As his condition deteriorated, Alicia decided to have Nash committed in mid-April.

Chapters 36-37

Chapters 36-37 Summary and Analysis

There were rumors in the MIT mathematics department that Nash's wife was going to commit him. Nash was oblivious to the talk but was involuntarily committed to McLean Hospital for observation. The hospital was affiliated with Harvard Medical School. He was confined in Bowditch Hall, a locked facility for men. The poet Robert Lowell was also a patient there and the two men spent time together.

The hospital received permission for a court to extend Nash's stay for an additional forty days. Nash was diagnosed as a paranoid schizophrenic. During his stay, his symptoms disappeared but the doctors thought that he was concealing them to secure his release. He was released fifty days after his commitment. His second son was born during his confinement.

In Chapter Thirty Seven, Alicia and her friend Emma rented a house while Nash was hospitalized. It was a difficult time for Alicia because many people criticized her decision to commit Nash. She was hoping to save her husband's career and mind.

Alicia gave birth to a baby boy on May 20. He remained unnamed until Nash was well enough to help select a name. Nash was allowed to visit the days after the birth.

When Nash was released, he went to MIT. A few days later, he hosted a Mad Hatter's Tea. He was planning to leave for Europe and resigned his position at MIT. When he decided to go to Paris, Alicia left the baby with her mother and accompanied him.

Chapters 38 - 41

Chapters 38 - 41 Summary and Analysis

Nash and Alicia sailed on the Queen Mary in July 1959 and arrived in London on July 18. They went on to Paris and found an apartment. Alicia enrolled in a French class. Nash continued his world government interest and intended to become a citizen of the world. He traveled to Luxembourg for this purpose. The American officials talked him out of renunciation of his citizenship and he returned to Paris.

The Nash's moved to Geneva, Switzerland and Alicia left for Italy to visit her cousin. Nash was alone. He decided that he wanted to be declared a refugee. Nash found that he didn't fit the definition of a refugee and the United Nations people suggested he talk to the Swiss police about asylum. After an investigation, they began to threaten him with deportation. Nash's passport disappeared in fall and he refused to apply for a new one. This meant that he couldn't travel.

Alicia returned to Paris from Italy and made arrangements for her mother and son, christened John Charles Martin, to come to Paris. In Geneva, Nash was considered an undesirable alien and ordered to leave the country. When he refused, he was arrested and still demanded to renounce his citizenship. He was finally allowed to go to Paris with Alicia.

The Nashes spent Christmas in Paris with their son, and Alicia's mother and cousin. In March, Nash traveled to East Germany where he may possibly have requested asylum but was told to leave. Alicia needed the help of the American officials and the French police to get Nash on a plane to the United States.

The Nashes are back in the United States in Chapter Thirty Nine. Nash went to Princeton while Alicia and the baby went to her parents in Washington DC. Alicia took a job at RCA in New York and left the baby with her mother. She rented an apartment and Nash moved in with her. Nash secured a short term consulting position at Princeton, but soon began to talk of returning to France. Alicia wrote to have the invitation withdrawn. The consulting contract was cancelled and Nash spent his time wandering around Princeton, which worried Alicia. Nash was committed again.

In Chapter Forty, Virginia and Martha travel to Princeton, at Alicia's request. Nash was committed to the Trenton State Hospital and received insulin coma therapy for six weeks. He hated the treatment and the resulting memory loss. The treatment was considered effective and Nash as released on July 15, 1961.

In Chapter Forty One, Nash secures a one year research position at Princeton. Alicia and Nash shared a house in Princeton with Alicia's parents. Nash wrote a paper and seemed to be recovered from his illness.

Nash asked for and received an invitation to work at the Institut des Hautes Etudes scientific in France. Alicia, knowing the marriage was over, decided not to go along.

That winter, Princeton colleagues again noticed deterioration in Nash. He traveled to the West Coast and saw Lloyd Shapley who noticed the deterioration. In June he left for Paris. He presented a good paper in spite of his mental situation. He was very ill by the time he returned to Princeton at the end of the summer of 1962 and moved in with Alicia.

Alicia filed for divorce on December 26, 1962.

Nash's colleagues worked out a deal for him to spend two years in treatment at the University of Michigan where he could work as a statistician, but he refused. Alicia, Martha and Virginia agreed that Nash must be committed.

Chapters 42-46

Chapters 42-46 Summary and Analysis

Nash was committed to the Carrier Clinic, a private psychiatric hospital near Princeton in 1963. At Carrier, Nash met psychiatrist Howard Mele, who played a significant role in his life for the next several years. When he was released, he rented a room since Alicia refused to allow him to live with her. Princeton again gave him a one year research appointment. Alicia attended parties with him but refused to resume their marriage.

Nash continued treatment with Mele on an outpatient basis. He was offered a one year position doing research and teaching a course. Dr. Mele thought he could handle the position. By February, Nash began having problems again and tried to secure a position in France instead of staying at Princeton.

Nash sailed on the Queen Mary. When his friend Grothendick was out of Paris, he went to Italy. On a visit to the Forum, he began to hear voices. Since he didn't return to Princeton for the semester, they revoked the job offer. When he did return, he was admitted to Carrier again in December, where he remained until mid summer.

In Chapter Forty Three, Nash is back in Boston working at Brandeis University. Norman Levinson had provided a research position for him. Nash began outpatient treatment with psychiatrist Pattison Esmiol. He also saw Eleanor and Jon David weekly and attempted to establish a social life. He wrote and published academic research papers again and discussed research ideas with colleagues. His ability to do such high quality research led people to question the diagnosis of schizophrenia. He accepted a position to teach at MIT in fall, but in late spring, his Brandeis colleagues noticed a change in him. The deterioration continued. Nash traveled to California to visit a cousin. He spent the winter and spring traveling around the West Coast while Dr. Esmiol begged him to return to Boston for treatment. He finally did return.

In Chapter Forty Four, Nash is forty in 1968 and is living in Roanoke with his mother. He traveled around the world in his mind. He still experienced symptoms but he was one of the people that was helped by antipsychotic medication. He lived in fear that Martha and Virginia would hospitalize him. After Virginia died in November 1969, Martha had him hospitalized but they said he was capable of taking care of himself and released him. He left for Princeton.

Chapter Forty Five discusses the Phantom at Princeton who keeps scribbling on blackboards. Students talked about a mathematical genius who flipped. Nash was the world's greatest numerologist. The blackboard writing was an attempt to communicate and in a way Princeton was therapeutic for him. He became interested in computers at this time.

Nash's friends and old classmates helped him whenever they could. He received the John von Neumann Theory Prize in 1978. Shapley was on the prize committee.

In Chapter Forty Six, Alicia allowed Nash to live with her in 1970. She was still hoping to see him recover. Alicia had a rough time financially after losing her job at RCA. She lived on welfare and food stamps and along with Nash, moved to a cheaper house in Princeton Junction. Alicia eventually found a programming position at Con Ed in Manhattan and commuted from Princeton.

Alicia learned that her son John had the same illness that his father had and was hospitalized. His other son, John Stier, won a scholarship to Amherst. The two boys met for the first time. John Charles attended Rider College and then Rutgers University on a scholarship and received his PhD in 1985.

Chapters 47-49

Chapters 47-49 Summary and Analysis

Peter Sarnak was a member of the Princeton faculty in 1990. He found Nash sitting in on his lectures and reading his papers. Nash helped him with comments and suggestions and constructive criticism. Nash was in a remission that occurred slowly over the years. He began making friends in the early 1980s.

Studies indicate that people can recover from schizophrenia over a long number of years. Nash described it as emerging from irrational thinking.

In Chapter Forty Eight, the announcement of Nash winning the Nobel Prize is made on October 12, 1994. The deliberations of the Royal Swedish Academy were highly secret. Nash first became a candidate in the 1980s but the Academy had issues with whether or not game theory was really relevant or if it was a fad. They also had issues with Nash's mental illness. The Academy decided in 1993 to award a prize for game theory; they then had to decide on the recipient. When they decided on Nash, they worried about embarrassment from his behavior.

In Chapter Forty Nine, as Nash is traveling to Sweden to accept the Nobel Prize, the United States government is holding an auction of air waves. The auction was designed on the principles of Nash's game theory. Many governments now use game theory in a variety of different ways. Auctions are designed based on the principles of game theory.

Chapter 50 and epilogue

Chapter 50 and epilogue Summary and Analysis

There was a celebration at Princeton after the announcement of the Nobel Prize awards. Everybody's fear about how Nash would cope proved groundless. Nash was still nurtured by his creative work and not by his closeness to people. He wanted to view himself as actively engaged in research and not at the end of his career. This is why he turned down an offer by Princeton to publish his collected works. Even so, he still re-established ties to his family and others.

Nash and Alicia had their son committed to Trenton State Hospital where he was while Nash was in Sweden. Johnny was unable to hold a job and refused to take his medicine when he wasn't in the hospital. So he kept becoming ill. Nash spent a lot of time with his son, trying to help him. Nash and Alicia also helped each other. They lived together but did not remarry.

Nash also became reacquainted with John Stier, now fifty four years of age. He was critical of John but took him to Berlin with him. John felt proud when he heard Nash's lectures.

In the Epilogue, Alicia and Nash remarry, forty years after their divorce. Nash is now seventy three years of age. Family and possessions are not important to him.

Characters

John Forbes Nash, Jr.

John Forbes Nash, Jr. is a brilliant mathematician who many consider to be a genius. He was born on June 13, 1928 to John and Virginia Nash in Bluefield, West Virginia. He and his sister grew up in comfortable circumstance since his father had steady employment with Appalachian Power during the Depression. As a child, he was introverted and a loner but bright and curious. While in high school, he was enrolled in courses in English, science and math at Bluefield College. After taking courses at Bluefield College, he won a Westinghouse Scholarship to the Carnegie Institute of Technology, which he attended from 1945 - 1948. He planned to become a chemical engineer then changed his major to chemistry during his first semester and then to mathematics during his second year. After graduating from Carnegie, he attended graduate school in mathematics at Princeton University. In the summer of 1949, he wrote his twenty-seven page thesis on game theory that resulted in the Nash equilibrium. This extended game theory to economics and other fields and eventually resulted in his winning a Nobel Prize. He spent four summers working at the RAND Corporation while he taught at Massachusetts Institute of Technology. Nash had a four year affair with Eleanor Stier and had a son, John David Stier, who he refused to support. The child was placed in foster care. When he was arrested for indecent exposure in 1954, he lost his job at RAND and learned that he couldn't do whatever he wanted and have the career and reputation that he desired. He married Alicia Larde in February 1957. They had a son, John Charles Martin. Nash began to have episodes of schizophrenia and had to be hospitalized several times. Nash began to recover in the 1980s and received the Nobel Prize for Economics in 1994. He and Alicia remarried when he was seventy-three years of age.

Alicia Larde Nash

Alicia Larde Nash is from an elite Central American family. Her ancestors had been wine growers in Champagne, France and moved to Baton Rouge during the revolution. Their son Florentin moved to San Salvador, married and became a wealthy land-owner. Her father was Carlos Larde Arines who came from a family of professionals. Carlos studied medicine in El Salvador, America and France. He held a variety of prominent positions. His second wife was Alicia Lopez Harrison who was also from a prominent and wealthy family. Their daughter Alicia was born on January 1, 1933 in San Salvador. She had a brother who was five years old at the time and a half brother from her father's first marriage. Alicia was called Lichi by her family and was raised in a villa near the capital. She had a storybook life until she was eleven years of age and her family left the country during a revolution. They settled in Biloxi, Mississippi. Her parents were not happy there and the young Alicia had to learn English. After a year in Biloxi, the family moved to New York where Alicia attended the Catholic Prospect High School in Brooklyn. Her sophomore year, she attended Marymount School, an exclusive Catholic

girls' school in New York City. She had a natural aptitude for mathematics and science. She was accepted to MIT as a physics major. Her mother went with her to Cambridge. Alicia was a student in John Nash's calculus class. She met Nash again when she worked at the Music Library and developed a crush on him. Alicia began to date Nash in July 1955. They married in February 1957, and had a son John Charles Martin. When John began to experience schizophrenia, Alicia had him committed. When she couldn't deal with his illness anymore, she divorced him in 1963. In the 1970s he allowed him to live with her and remarried him when he was seventy three years of age.

Solomon Lefschetz

Solomon Lefschetz is the mathematician who recruited Nash for graduate work at Princeton. He was chairman of the mathematics department there. He was born in Moscow and educated in France. He received his PhD in mathematics from Clark University, where he met and marries his wife. After teaching in Nebraska and Kansas, he accepted a position at Princeton.

Eleanor Stier

Eleanor Stier was a Boston nurse from the Jamaica Plain section of Boston. She had an affair with Nash and bore his son, John David Stier, on June 19, 1953. She and Nash did not marry and he did not support her after the baby's birth. Eleanor had to place the child in foster care. Their affair lasted for four years. She remained in touch with Nash because of their son.

John David Stier

John David Stier was born on June 19, 1953. His parents were Eleanor Stier and John Nash. Since Nash refused to support mother and son, the child was placed in foster care. Nash saw him until 1959 when he disappeared from the boy's life and didn't reappear until the boy was twelve. He attended Amherst College on a scholarship and became a nurse.

Lloyd Shapley

Lloyd Shapley was the son of Harvard astronomer Harlow Shapley and attended college on a Westinghouse Scholarship and did his graduate work in mathematics with Nash at Princeton. Shipley and his four siblings were born and bred in Cambridge, Massachusetts. Shapley also spent summers working at RAND. Shapley stayed in touch with Nash and was instrumental in Nash receiving the von Neumann prize.

John Charles Martin Nash

John Charles Martin Nash was born on May 20, 1059 to Alicia and John Nash. His father was confined to the McLean Hospital at the time. He was left with his grandmother while his parents traveled to Europe. He lived with Alicia after his parents divorced and began having episodes of schizophrenia in his late teens. He received a PhD from Rutgers University in 1985.

Margaret Virginia Martin Nash

Margaret Virginia Martin Nash was the daughter of a physician. She attended Martha Washington College and West Virginia University and was a teacher until she married John Nash Sr. They had two children, John Jr. and Martha. Virginia had her son committed several times and had him living with her until her death in November 1969.

Martha Nash

Martha Nash was the sister of John. She graduated from the University of North Carolina at Chapel Hill and traveled to Santa Monica with John for his second summer at RAND. She married Charlie in spring of 1954 and had two children. She had her brother committed several times and remained estranged from him until the 1980s.

John Forbes Nash, Sr.

John Forbes Nash, Sr. was born in 1892 at his grandparents' plantation in northern Texas to Alexander and Martha Nash. He married Virginia Martin and they had two children, John Jr. and Martha. John Sr. worked for Appalachian Power until his death in September 12, 1956.

Objects/Places

Bluefield, West Virginia

Bluefield, West Virginia is a town in southwestern West Virginia.

Pittsburgh

Pittsburgh is a city in southwestern Pennsylvania where the Carnegie Institute of Technology is located.

White Oak, Maryland

White Oak, Maryland is a suburb of Washington DC.

Princeton

Princeton is located in northwest, New Jersey and is the location of Princeton University.

Santa Monica, California

Santa Monica, California is a suburb of Los Angeles and is where the RAND corporation is located.

Cambridge, Massachusetts

Cambridge, Massachusetts is the Boston suburb where Massachusetts Institute of Technology is located.

Seattle

Seattle is a city in the northwestern state of Washington where Nash spent the summer of 1956.

New York City

New York City is located on the Eastern coast of the United States and is where Nash spent his 1956-57 sabbatical.

Washington DC

Washington DC is the nation's capital and located on the east coast. It is the site of Nash's wedding to Alicia in February 1959.

Paris

Paris is the capital of France and the place both John and Alicia lived.

Roanoke

Roanoke is a city in southwestern Virginia where Virginia and Martha lived.

Themes

Illness

The dominant theme of the book is that of illness. John Forbes Nash Jr. was a mathematical genius whose career and life were marred by paranoid schizophrenia. Nash was a loner as a child and didn't relate well to others. This remained a problem throughout his life. He would belittle people and engage in inappropriate pranks. When his paranoid schizophrenic episodes began, he believed that he was being contacted by aliens from outer space who wanted him to save the world. He was trying to form a world government and contacting different embassies with this goal in mind. He would write letters in different colored inks and crayons. When he was released from this first hospitalization, he wanted to go to Europe so Alicia left their newborn son with her mother and went with him. He spent several months in Geneva, trying to renounce his American citizenship. He finally 'lost' his passport. The Swiss declared him an undesirable alien and ordered him to leave. When he refused, he was arrested. Alicia brought him to Paris where the problems continued. Nash finally had to be taken to the airport by the police and returned to the United States. Nash spent many years roaming around Princeton writing messages on blackboards. He didn't work or relate well to people but the Princeton environment was therapeutic for him. After several hospitalizations and living with his mother, he began to relate to people and discuss mathematics and helped them with their research.

Loyalty of Friends

Nash grew up as a loner. He did not relate well to other people and this social ineptness followed him into adulthood. Nash would belittle people and engage in inappropriate pranks and this behavior alienated many people. Most people overlooked his behavior because of his genius. They respected his mathematical abilities and genius and were able to overlook his behavioral problems. Even though Nash did not have any real close friends, his friends and colleagues were there to help him when he became ill. When he was released from the hospital, Princeton arranged for a research position for him to help him recover and regain his working abilities. They did this several times over the years to try to help him regain his productivity. Some of these positions Nash attempted and others he refused. Colleagues at MIT helped secure a position at Brandeis for him. They were all sympathetic towards his problems as many of them had experience with mental illness or their family members did. His friends arranged the details and financing for two years of treatment at the University of Michigan where he would work as a statistician but he refused the arrangement. His graduate school classmate, Lloyd Shapley, helped Nash gain recognition for his work by nominating him for the John von Neumann Theory Prize, which Nash was awarded in 1978. When he would spend his time at Princeton, he wasn't treated as an outcast. They would spend time talking to him, discussing mathematics, until he began to experience a remission in the 1980s.

Relationship - Alicia and John Nash

John Nash always had problems with social relationships. As a youngster he would dance with a stack of chairs instead of with a girl. Alicia had been a student in Nash's class and was infatuated with him. She met him again when she worked in the Music Library. This was after Nash had been dismissed from his summer consulting job at the RAND Corporation after his arrest for indecent behavior. Nash did not consider himself a homosexual but he was attracted to men. After his experience at RAND, Nash realized he could not do whatever he wanted and still have the kind of career and reputation that he wanted. Alicia adored Nash and married him even though she knew about his mistress and son. She was the one who made the difficult decision to commit him. Alicia tried to protect Nash as much as she could. She didn't want to see his mind destroyed and wanted to see him recover his mathematics capabilities. Alicia left her newborn son and accompanied Nash to Europe. When she couldn't deal with Nash and his illness any longer, she divorced him. Nash did not seem to be affected by the divorce when it happened. In the 1970s, Alicia allowed Nash to live with her and he trieds to help with their son, who also suffered from paranoid schizophrenia. They lived together for many years. As Nash began to recover from his illness, relationships became more important to him. Alicia finally agreed to remarry him when he was seventy three years of age.

Style

Perspective

A Beautiful Mind is written by Sylvia Nasar in the third person point of view. This approach allows the author to provide the detail and background information that is necessary for the reader. The author, who functions as the narrator, provides information about mathematical theories, economics and schizophrenia. She discusses the various courses of treatment available at the time and the kind of treatment that Nash had. At several points, Nasar examines Nash's performance and discusses whether or nor Nash was correctly diagnosed. The use of the third person approach allows the author to explore all of the areas. The result is a book that contains a wealth of information from different disciplines which adds to the thoroughness and completeness of the book. Since the author is writing about the life of John Forbes Nash Jr., this is the only approach that she could take.

The book is well written in a way that imparts the appropriate amount of information to the reader. The author provides enough information about the different aspects of mathematics for the reader to grasp what Nash's work involved. The same is true about the different areas and treatments for schizophrenia. The author is a professor of journalism at Columbia University and a former economics correspondent for The New York Times. She is well qualified to write a book of this kind.

Tone

The author, Sylvia Nasar, writes A Beautiful Mind in an objective tone. Her goal is to tell the story of the life of mathematical genius John Forbes Nash, Jr. and the devastating effects of the illness he suffers. Her approach is to present the facts and to explain them and she does this well in an objective manner. She examines Nash's childhood and finds he was a loner who had problems in social situations. She looks at his behavior in graduate school and in his employment at Massachusetts Institute of Technology and at the RAND Corporation. Nasar explains how Nash's illness manifested itself and explains his mental deterioration that resulted in his repeated hospitalization. She discusses and explains the illness and its treatment. The author is not critical of Nash's family for the several commitments. She explains that they felt that they were doing what was best for him, even though Nash's colleagues were critical of the family. The author describes Nash's life and how he struggled with his illness until he finally began to recover in the 1980s. The author's tone and approach are appropriate to the kind of book she has written and her goal of presenting the life of Nash and the devastating effects of his illness. The reader has to appreciate the style and approach of the author.

Structure

The structure of A Beautiful Mind is chronological and designed to look at the different stages in the life of John Forbes Nash, Jr. The book is divided into five parts with a total of fifty chapters. There is a Prologue which introduces Nash, his work, and a brief sketch of his life. Part One: A Beautiful Mind examines Nash's early years and schooling. Part Two: Separate Lives examines Nash's social relationships before his illness and his marriage to Alicia. Part Three: A Slow Fire Burning examines his mental deterioration and hospitalization and Part Four: The Lost Years examines Nash's life during his illness. Part Five: The Most Worthy, discusses Nash's life during his recovery. The Epilogue describes the remarriage of the seventy three year old Nash to Alicia. Each chapter has a title that describes the subject matter of the chapter and begins with a quote.

The Table of Contents is detailed and provides the chapter titles and numbers along with the page numbers. There is a photo section which allows the reader to associate names with faces and adds to the realism of the book. There is a detailed and copious section of Notes for each chapter showing the sources of information. This is followed by a Select Bibliography. Both of these show the depth of the author's research and make it easy for reader's who want to look up information from the author's sources. Finally, there is a very detailed Index that makes it easy for the readers who want to look up information in the book.

Quotes

"Nash proved himself, in the words of the eminent geometer Mikhail Gromov, 'the most remarkable mathematician of the second half of the century.'" (Prologue, pg. 11-12)

"Princeton in 1948 was to mathematicians what Paris once was to painters and novelists, Vienna to psychoanalysts and architects, and ancient Athens to Philosophers and playwrights. Harald Bohr, brother of Niels Bohr, the physicists, had declared it 'the mathematical center of the universe' in 1936." (Chapter 3, pg. 50)

"Nash was intrigued by the apparent wealth of interesting, unsolved problems. He soon became one of the regulars at the seminar that met Thursdays at five o'clock; before long he was identified as a member of 'Tucker's clique.'" (Chapter 8, pg. 83)

"Von Neumann's rejection of Nash's bid for attention and approval must have hurt, however, and one guesses that it was even more painful that Einstein's earlier but kindlier dismissal." (Chapter 10, pg. 94)

"Neither the prospect of playing military strategist, nor living in Santa Monica, nor earning a handsome salary tempted Nash to accept William's offer of a permanent post at the think tank. Nash shared little of RAND's camaraderie or sense of mission. He wanted to work on his own and to have the freedom to roam all over mathematics. To do that, he would have to obtain a faculty position at a leading university." (Chapter 14, pg. 122)

"At the time, Nash was no doubt far more preoccupied with the draft - not to mention growing complications of his personal life - than with the possible repercussions for himself of the persecution of his benefactors. Nevertheless, the whole episode was a warning that the world he and other mathematicians inhabited was an extremely fragile one." (Chapter 19, pg. 152)

"All through his childhood, adolescence, and brilliant student career, Nash had seemed largely to live inside his own head, immune to the emotional forces that bind people together. His overriding interest was in patterns, not people, and his greatest need was making sense of the chaos within and without by employing, to the largest possible extent, the resources of his own powerful, fearless, fertile mind."(Chapter 21, pg. 167)

"It was part of Nash's genius to choose a woman who would prove so essential to his survival. He took her willingness to pursue him, to make every effort, not merely as flattery, to which he was no less immune than the next man, but as a sign that she was prepared to take him as he was. He saw her determination to have him as a real key to her character, suggesting that she knew what she was getting and expected nothing more." (Chapter 27, pg. 199)

"Nash's view was perhaps overly subjective. Mathematics is not an intramural sport, and as important as being first is, how one gets to one's destination is often as important as, if not more important than, the actual target. Nash's work was almost universally regarded as a major breakthrough." (Chapter 30, pg. 220)

"Alarmed, Alicia searched for explanations rooted in their day-to-day life. Her first thought was that Nash was unduly worried about the impending tenure decisions. She suspected that the prospect of a baby, with all the new responsibilities that implied, was another source of pressure. And she wondered whether marriage to someone 'different' like her wasn't proving too much of a strain for a southern WASP." (Chapter 35, pg. 249)

"For days the younger people in the department had been speculating - based on hints dropped by Ambrose and some of the other senior faculty - that Nash's wife was about to have him committed. Furious controversies had broken out over whether Nash was truly insane or merely eccentric, and over whether, insane or not, anyone had the right to rob a genius like Nash of his freedom." (Chapter 36, pg. 253)

"What their real plans were at the time, Alicia was later unable to say. She had followed Nash to Europe, not because she hoped that Paris would provide a cure for his troubles, but because she had no way of stopping him, and, that being the case, she had not been able to bear seeing him go off to a strange land, alone, without someone to watch over him." (Chapter 38, pg. 270)

"But he was terribly lonely. He missed Alicia and John Charles. He felt his new, humbler status in the mathematical hierarchy most acutely. But he also could see, perhaps for the first time since the onset of his illness, that there was, after all, a future for him, and he entertained hopes of reestablishing himself as an academic and even of finding someone new to share life with." (Chapter 43, pg. 314)

"But, in contrast to the onset of his illness, which became full-blown in a matter of months, the remission took place over a period of years. It was, by his own account, a slow evolution, a 'gradual tapering off in the 1970s and 1980s.'" (Chapter 47, pg. 350)

"Third, Nash said that he had won for game theory and that he felt that game theory was like string theory, a subject of great intrinsic intellectual interest that the world wishes to imagine can be of some utility. He said it with enough skepticism in his voice to make it funny." (Chapter 50, pg. 379)

Topics for Discussion

What was the childhood of John Nash like? Were there any indications of mental illness?

How did Nash become interested in mathematics? Were there any indications in his childhood of his genius?

What indications of Nash's illness were evident to his colleagues and family? What did they think?

Why was Alicia criticized for having Nash committed? What was her objective?

How did Nash describe his illness? What were the symptoms that everyone around him recognized as signs of his mental deterioration?

What problems were involved in awarding Nash the Nobel Prize for Economics in 1994? What were the concerns of the Academy?

What are the arguments for and against Nash's diagnosis of paranoid schizophrenia? Why did some people questions the diagnosis?