

**The 2006-07 Otto L. Walter Lecture:  
The Emergence of a New Science of the Mind: Legal and Ethical Considerations  
November 8, 2006**

“I’ve given a number of lectures,” began Nobel Laureate Eric R. Kandel during the 2006-07 Otto L. Walter Lecture delivered at New York Law School on November 8, 2006. “But I’ve never spoken to an audience in a law school, and this really thrills me to no end.” In addition to discussing his work in the field of “biology of mind,” Dr. Kandel also spoke about the legal, ethical, and moral implications of his research. “I think, in some ways, legal scholars are even more conservative, I might say, than medical scholars,” he said.

In recent decades, the field of “biology of mind” has made great advances in explaining the actual biological processes behind the working of the mind. Dr. Kandel’s contributions to the study of the cellular and molecular processes of memory – or, in his own words, “the processes in the brain that enable us to remember” – earned him a Nobel Prize in Physiology or Medicine in 2000. According to a glowing *New York Times* review of a Dr. Kandel’s recently-published book, *In Search of Memory*, “Kandel’s life work has been to demonstrate that memory, learning and, by extension, every other mental process are the result not of some vague set of unexplainable psychic phenomenon, but rather of distinctive molecular events determined by the physicochemical qualities of cellular life.”

Dr. Kandel’s interest in the nature of memory is rooted in his childhood experiences in Vienna shortly before the outbreak of World War II when his family was forced to flee to the United States to escape persecution by the Nazis. His still-vivid memories of living in Vienna include, for example, humiliations suffered at the hands of the Nazis and being stripped of his personal belongings, including a cherished remote-controlled model car. While attending New York University medical school in the United States after graduating from Harvard College, Dr. Kandel said that he began to explore memory in biological terms by trying to answer questions such as “How did the Viennese past leave its lasting traces in the nerve cells of my brain?” and “How did the terror sear the banging on the door of our apartment [by Nazi policemen] into the molecular and cellular fabric of my brain with such permanence?” He is currently University Professor of Physiology and Psychiatry at the Center for Neurobiology and Behavior of the Columbia University College of Physicians and Surgeons, and his laboratory studies explicit and implicit (or unconscious) memory storage.

Dr. Kandel also discussed several ethical and moral issues surrounding recent scientific advances concerning memory. When, for instance, should medical professionals and others prescribe treatments called “cognitive enhancements”? In one scenario, Dr. Kandel generally supported giving some medication to people whose memories were clearly deteriorating. “I think most of us would not have difficulty if somebody was 65, 70, 75, 80 years old,” he said. “They had a weakness of memory, and you gave them a pill. If you have arthritis, you take a pill. If you have a stomachache, you take a pill. So if you have a weakening of memory with age, you should take a pill, I feel, if you want to.” But Dr. Kandel also said that such treatment should be restricted to “people who have a medical need for it, if they have mental retardation, if they have some cognitive disability of some sort.” Without such limits, he worried that people would take certain medications for unapproved purposes. “If the kid is 22 years old and is about to apply to New York Law School,” he said, “and feels that he doesn’t want to study very hard, thinks that [taking] a pill will enhance his memory, I’m not enthusiastic about his taking a pill.”

In contrast to improving people’s memory, Dr. Kandel also discussed the moral and ethical implications of removing memories. “Should we remove memories from people’s brains?” he asked. “If we have the capability of going in there and somehow interfering with the storage process, to what degree would we be interfering with the character, the very being [of people] since we are what we are, in large part, because of what we learn and what we remember.” Although Dr. Kandel remembers well the Nazi persecution that his family faced while living in Austria, he said that he would not want

to remove his memories, for example, of Kristallnacht in 1938 when Nazi sympathizers destroyed the homes and stores of thousands of Jews living in Germany and Austria. He also questioned whether people would want to erase memories of even more horrible experiences such as living in concentration camps during the Holocaust. "I also think probably not. That is a more debatable point," he said. "But I think most people would say no."

Using more contemporary examples, Dr. Kandel discussed whether a fire department should provide medication to firefighters and others involved in dangerous and life-threatening work, which would alter their memories but make them perform better. "Would we have the right to recommend to the people going into the fire that they take a pill – and there is a pill available not made by memory pharmaceuticals – that would allow you to function effectively in that fire, but would remove the emotional impact of that fire so that you would not remember it later on?" Dr. Kandel said that while "I would have no difficulty with [making] that [decision]," he added that "lots of people would." But he argued that "we have a moral obligation to protect the mental functioning of people if we send them into battle or if we [for instance] send them into a fire. I think that it's the society's responsibility to try to protect the people who defend society as much as possible."

In addition to these issues, Dr. Kandel also discussed the legal implications concerning discoveries in the field of biology of mind. He said that "a lot of the learning processes that we engage in are unconscious." Dr. Kandel noted that several studies have revealed that many people believe they make conscious decisions when, in fact, those decisions are made unconsciously. "That has a lot of legal implications," he concluded. "If a lot of voluntary acts are, in fact, mediated unconsciously, am I responsible for taking this glass [of water sitting at the podium] and throwing it at somebody? It's an unconscious act, and I'm unaware of it."