

In-Between Proust and Neuroscience : Kandel's 'In Search of Memory'

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In his autobiography allusive of Marcel Proust's literary autobiography *À la recherche du temps perdu*, Kandel describes and explores his own development as a molecular scientist who started out as a student of history and psychoanalysis with more than just a penchant for literature. Despite his conversion to neuroscience, which is told in great detail, Kandel's motives in studying the brain are informed mainly by humanist ideals and episodes from his personal past. The author creates an image of himself as a scientist who is guided in his molecular research by both his good intuitions and received theories from the humanities. Hence, the aim of the present paper is to show how the author succeeds in modelling his scientific *ethos* at the interface of the humanities and the natural sciences and in what ways he generates a public image of himself as a 'self-made man' or, rather, scientist.

1. Introduction

Eric Kandel received the Nobel Prize in the category Physiology or Medicine in 2000, together with his colleagues Arvid Carlsson and Paul Greengard. The Nobel Prize Lecture, which is always partly autobiographical, inspired Kandel to retrace his scientific fascination with learning and memory in his autobiography *In Search of Memory : The Emergence of a New Science of Mind* (2006)². Since neuroscience has recently been hailed as *the* leading science among the cognitive sciences, the success of Kandel's autobiography can partly be attributed to the public's growing interest in neuroscientific discoveries – but not exclusively. Kandel's readership is not only constituted by either experts in the field or historians of science. It is also constituted by people who read it to learn more about the man behind the success as well as about his time and place. With regard to the latter, Kandel's autobiography is highly informative. Born into a Jewish family on November 7th 1929 in Vienna, Kandel lived through the difficult times before and during the ascent of the Nationalist Party in Germany and the annexation of Austria by Hitler-Germany. In 1939, at the age of nine, he and his brother were forced to emigrate to the USA in order to escape the violence committed against Jews and the frequent violations of their rights.

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² Eric KANDEL, *In Search of Memory : The Emergence of a New Science of Mind*, New York, Norton, 2006.

As poor Jewish immigrant to the US, Kandel adapted well to his new surroundings and overcame his relatively humble beginnings through his intellectual skills. In so doing, he did not only receive international recognition as a scientist but he also 'lived up' to the American Dream.

The aim of this paper is twofold. Firstly, it investigates in how far the biographical narrative conforms to the American image of the disadvantaged immigrant who makes it, so to speak, 'from rags to riches'. Closely associated with this is the question, which culturally available images Kandel uses in order to create his own personal myth when he writes his autobiography. In this respect, it is helpful to remember the tenets of imagology as outlined, for example, by Joep Leerssen in « Imagology: History and Method »³. Imagology, it will be recalled, engages among others with « national stereotyping and identity construction »⁴ in literary representation of nations and national identities. Although autobiography is often regarded as a subgenre of biography and therefore counted among factual and historical records⁵, there is much to say in favour of autobiography being a specimen of literature. The most pungent argument is probably that autobiography frequently employs narrative and rhetorical devices that are based on fictional, literary models in recounting a life. Moreover, the problem of identity addressed in most autobiographies is often linked up with the problem of a national identity. The current trend in imagology is to treat representations of nation and national identity no longer as essentialist categories but rather as collective efforts at constructing a nation and a national identity⁶. Literary representations of a nation and/or national identity can be influenced by existing conceptions and influence them in turn. Thus, Leerssen introduces imagology's field of research by highlighting the cultural 'work' of literature: « To begin with, Imagology, working as it does primarily on literary representations, furnishes continuous proof that it is in the field of imaginary and poetical literature that national stereotypes are first and most effectively formulated, perpet-

³ Joep LEERSSEN, « Imagology : History and Method », in Manfred BELLER-Joep LEERSSEN, dir., *Imagology. The Cultural Construction and Literary Representation of National Characters. A Critical Survey*, Amsterdam, Rodopi, pp. 17-32.

⁴ *Ivi*, p. 24.

⁵ Misch conceptualized autobiography in 1907 as a biography written by the biographical subject about himself or herself. Hence, autobiography has for a long time been regarded as a subgenre of biography also known as 'self-biography' or 'Selbstbiographie' (cf. Georg MISCH, *Geschichte der Autobiographie: Erster Band: Das Altertum*, Leipzig and Berlin, Teubner, 1907, p. 5).

⁶ Cf. *Ivi*, pp. 21-22.

uated and disseminated »⁷. Likewise, I claim that this kind of cultural work is not exclusively restricted to 'imaginary and poetical literature' but extends as well to autobiography.

In the case of autobiography, the mutual reciprocity of national and individual identity constructions becomes obvious. Especially the possibility for identification offered by certain nation-specific images looms large in autobiographies. In turn, a given stock image is modified by each actualization of it. Since Kandel's scientific autobiography can also be read as a literary autobiography, I propose to analyse *In Search of Memory* with regard to the narrative strategies employed by Kandel in order to fashion a public persona that relies heavily on the narratives produced by and the clichés inherent in the US-American immigrant ethos of the American Dream.

Secondly, the paper analyses Kandel's self-fashioning at the interface between the humanities and the natural sciences. Since this is probably the most striking aspect that distinguishes Kandel's autobiography from most other scientific autobiographies, a great part of this paper engages with Kandel's vacillation between different disciplines, especially between introspective, philosophical literature, here represented by Proust, and neuroscience. What ends does this pervasive oscillation between the humanities and neuroscience serve in Kandel's autobiographical self-fashioning ? The answer to this question, I propose, is at the core of the autobiography's narrative trajectory, a trajectory that aims at establishing the man as a self-made success, not despite of but *due to* his allegiance to different disciplines.

2. The Personal Myth

Autobiographies, as is common knowledge now, rely for the greatest part on the creation of a personal myth. The personal myth Kandel creates in the process of putting his life to paper is not to be understood as an invented or fantasized tale about himself, but as the process whereby the scientist creates meaning of his life from hindsight, taking into consideration matters and narrative strategies required to create, modify and/or sustain his public image. With regard to autobiographies by scientists of standing, Grmek warns of the effects by « the progressive transformations of personal experience into a message addressed to others, and of the original information into a fairy tale intended to amaze the scientist himself as well as his peers and the gen-

⁷ *Ivi*, p. 26.

eral public »⁸. What Grmek observes amounts to the recognition that in telling our lives to other people, we tend to adapt these lives in the telling to the messages we want to communicate, leaving out what would obfuscate the message. In the case of scientists, this means that the personal life is often treated as being subservient to the scientist's success. The fairy-tale quality of scientific autobiographies is the product of a sense of predestination created in the telling that seemingly is the key to the scientist's success. Kandel's own success story has been re-iterated in many different media so that as of now it has acquired almost a fairy-tale quality. The frequent re-tellings of his life underline this aspect, for they put the finishing touches to Kandel's amazing life and achievements.

Kandel's Nobel Prize Lecture was followed by the writing and the publication of his autobiography that, in turn, served as the basis for the production of a film by Petra Seeger⁹. Not even counting the many autobiographically inspired speeches on his research subject delivered since the reception of the Nobel Prize, Kandel has acquired the status of a celebrity. In the film, a female student at Brooklyn College, where Kandel was scheduled to deliver a speech based on his autobiography, even referred to him as « the rockstar of neuroscience »¹⁰. As Leerssen observes with regard to imagology, the existence of a national image is dependent on conventions, e.g. literary tropes and commonplaces, which come into being through repetition and last as long as they are actualized in a community such as the nation¹¹.

Likewise, Kandel is, wittingly or not, turned into a national icon through the frequent re-tellings of his life-story. However, this may only be a byproduct of Kandel's intentions to further the progress in communicating science and scientific findings to a lay audience. Communicating science is as important as furthering the progress of science. This statement corresponds with one of Kandel's most cherished convictions. Many of Kandel's speeches delivered after the reception of the Nobel Prize are a case in point of communicating science in a way that even a non-specialised audience can grasp a specific scientific problem or discovery. His Nobel Prize Lecture comprises brilliant moments of turning science into entertainment for the masses. One

⁸ Mirko D. GRMEK, « A Plea for Freeing the History of Scientific Discoveries from Myth », in M. D. GRMEK-Robert S. COHEN-Guido CIMINO, dir., *On Scientific Discovery : The Erice Lectures 1977*, Dordrecht, Reidel, 1981, pp. 9-42, and p. 15.

⁹ Petra SEEGER, *Auf der Suche nach dem Gedächtnis - Der Hirnforscher Eric Kandel*, FilmForm Köln together with Arte, ORF, WDR, 2008, 2010.

¹⁰ *Ivi*, 4:52.

¹¹ Cf. J. LEERSSSEN, *Imagology*, *op. cit.*, p. 26.

of its highlights is a graphic showing the marine water snail *aplysia*, which served Kandel as research object in investigating memory and learning on a physiological basis, wearing the Nobel Prize medal around its neck¹². Such a graphic would not be out of place at a science slam where an audience is at the same time informed and entertained by an expert trying to communicate complex scientific questions, for it provides a moment of comic relief, an opportunity for laughter and relaxation from difficult and challenging matters. This instance is typical for the way Kandel tries to communicate not only scientific discoveries but also the fascination of doing science as well as his personal enthusiasm for neuroscience.

Though entertaining episodes abound in his autobiography and speeches, Kandel acknowledges the importance of communicating science as a means to facilitate the necessary participation of different social groups in deciding how a certain scientific discovery should or should not be applied, which should not be the exclusive realm of scientists : « The [...] issue relates to an evaluation of how, if at all, a scientific discovery is to be used. This evaluation should not be left to scientists, because it affects society at large. Scientists can contribute to discussions about how the products of science are to be used, but final decisions require the participation of ethicists, lawyers, patients' rights groups, and clergy, as well as scientists »¹³. In this respect, Kandel's creation of a public persona, entertaining and charming in relating autobiographical anecdotes, serves a certain purpose. This purpose is known as « *delectare et prodesse* », to « delight and to enlighten »¹⁴. Considering that his great efforts at communicating science are accompanied by the effort to kindle the same enthusiasm he feels for his subject in others, it seems that he dexterously uses his public persona created in the autobiographical text and speeches to reach this aim.

3. An Immigrant's Biography

The very allure of Kandel's autobiography and his public speeches is due to the fact that he combines biographical detail with scientific facts in such a way that his scientific success seems

¹² The image is also included in Kandel's autobiography, cf. E. KANDEL, *In Search of Memory*, *op. cit.*, p. 400. The Nobel Prize Lecture can be watched on the internet at http://www.nobelprize.org/nobel_prizes/medicine/laureates/2000/kandel-lecture.html.

¹³ E. KANDEL, *In Search of Memory*, *op. cit.*, p. 333.

¹⁴ The quote is by the Latin poet Horace who said that the purpose of poetry is to « delight and enlighten » the reader, « *delectare et prodesse* ».

to be the outcome of his personal history. That his autobiography has become a great success has also to do with his individual biographical background that reflects the experiences of Jews in Germany and Austria during the ascension of the Nationalist Socialist Party, as well as the experiences of immigrants to the US, paired with acute socio-historical observations. Kandel described his background as being from a « lower middle class Jewish family »¹⁵ and, given his rather modest circumstances and his early forced emigration from Vienna, added that « there was no one less likely to make a scientific career than me »¹⁶. The chances at least were not too bad, given the fact that despite his family being rather poor, as Kandel admits, the members of his family placed great value on learning. For them, as Kandel explained in his autobiography, being Jewish also meant to value education over financial success. After his emigration to and education in the US, he met Denise, another European Jewish émigré, whom he was eventually going to marry. Significantly, Denise's father had advised her « to marry a poor intellectual because such a man would value scholarship above all and would strive to pursue exciting academic goals »¹⁷, as Kandel states. This indirect self-characterization lays the foundation for Kandel's personal myth that coincides with the myth of the American Dream which claims that any immigrant can move upwards socially and financially in the 'land of the free'.

With their emigration from Vienna, Austria to the US in 1939, Kandel's parents ensured not only the survival of their family that was persecuted in Vienna but also that their children could grow up without being discriminated for being Jewish. About his father, Hermann Kandel, Kandel said : « He [...] loved America. Like many other immigrants, he often referred to it as the *goldene Medina*, the land of gold that promised Jews safety and democracy. In Vienna he had read the novels of Karl May, which mythologized the conquest of the American West and the bravery of American Indians, and my father was in his own way possessed of the frontier spirit »¹⁸. Even if Kandel views America in less romantic terms, his autobiography is nevertheless suffused by his admiration for the American 'sciencescape'. Characteristic of this sciencescape is the absolute freedom of research. But there was something else that impressed Kandel even more strongly than the freedom to do science : « I began to realize that what makes science so distinctive, particularly in an American laboratory, is not just the experiments themselves, but also the social context, the sense of equality between student and teacher, and the

¹⁵ P. SEEGER, *Auf der Suche nach dem Gedächtnis*, op. cit., 5:55.

¹⁶ *Ibidem*.

¹⁷ E. KANDEL, *In Search of Memory*, op. cit., p. 50.

¹⁸ *Ivi*, p. 35.

open, ongoing, and brutally frank exchange of ideas and criticism »¹⁹. The image of America as the land of the free in Kandel's autobiography even pervades the American laboratory. There it manifests itself in the freedom of the scientists and the equal relationships between scientists of different faiths, beliefs and even standing. In citing Gerald Holton, a historian of science at Harvard University, Kandel points out that « for many Viennese émigrés of my generation, the solid education we obtained in Vienna, combined with the sense of liberation we experienced on arriving in America, released boundless energy and inspired us to think in new ways. That certainly proved true to me »²⁰.

His American education that began at the Jewish institution Yeshivah of Flatbush, Brooklyn, provided him with roots, both intellectually and religiously. When constructing a personal identity, he acknowledges the importance of being part of the Jewish intelligentsia. Thus, he states about the achievements of another Yeshivah pupil : « It gave me both pleasure and pride to learn later that Baruch S. Blumberg, who won the Nobel Prize in Physiology or Medicine in 1976, had also benefited from the extraordinary educational experience provided by the Yeshivah of Flatbush »²¹. His beginnings as a neuroscientist were prepared by an interest in psychoanalysis that was furthered by his reading Freud, especially Freud's theory of the id, the ego and the superego whose seat in the brain Kandel originally wanted to spot when entering the community of neuroscientists. The religious community and the scientific communities to which Kandel belonged are made to intersect, for example when Kandel recounts episodes from scientific history and places himself wittingly in the tradition of Jewish scientists from Vienna (the most famous of these scientists being, of course, Sigmund Freud). Thus, he states : « My attraction to psychoanalysis was further enhanced by the facts that Freud was Viennese and Jewish and had been forced to leave Vienna. Reading his work in German awakened in me a yearning for the intellectual life I had heard about but never experienced »²².

Bearing in mind that Kandel was an immigrant to the US, statements like these reinforce the impression that Kandel constructs his own identity from participating in what Benedict Anderson called « imagined communities »²³. In Kandel's case, the imagined community supported

¹⁹ *Ivi*, p. 106.

²⁰ *Ivi*, p. 33.

²¹ *Ivi*, p. 34.

²² *Ivi*, p. 42.

²³ For the definition of 'imagined community', cf. Benedict ANDERSON, *Imagined Communities : Reflections on the Origin and Spread of Nationalism*, London, Verso, 1983.

his sense of an identity in providing a common grounds and an interpersonal ethics that is imaginatively reconstructed in Kandel's writings. Moreover, putting himself into the intellectual tradition of Freud and other scientists, Kandel can be said to carve out for himself a position in the long line of illustrious scientific figures.

4. A Proustian Moment

Kandel's motivation for studying memory seemingly originated in a Proustian moment. Part of Kandel's personal myth is a teleological reconstruction of how the memory of a childhood experience induced his scientific curiosity. The great popularity of Kandel's autobiography is augured by its title that alludes to Marcel Proust's masterpiece *À la recherche du temps perdu* whose famous madeleine episode, an instance of *mémoire involontaire*, serves as a foil for Kandel's most decisive childhood memory. Everyone familiar with Proust's masterpiece knows the famous scene where the protagonist Marcel tastes a special biscuit, a madeleine, and is immediately transported into the past that is re-experienced in all its atmospheric detail. This instance of *mémoire involontaire* conjures up the entire scene from the past because the taste of this peculiar biscuit is a strong cue for the seemingly forgotten memory.

The key event around which the early frightening experiences of Kandel's childhood in Vienna are organized is shortly after his ninth birthday on 9th November 1938, the so-called *Kristallnacht*, when all of a sudden the peaceful atmosphere of the home is invaded by a banging on the door and the entrance of policemen who expelled the family from their home and ransacked their apartment. The Proustian moment of *In Search of Memory* shows how Kandel, the scientist, who, many years after the event, sits in his laboratory and listens to the discharge of action potentials in neurons producing the sound « bang – bang – bang », is immediately transported into the past and re-experiences the banging on the door. Kandel was intrigued by the enduring power of this very special memory and therefore engaged with research questions concerning the mechanisms of memory and learning.

In his fictionalized autobiography, Proust made an important discovery merely through observing the workings of his own autobiographical memory via introspection. He discovered that memories involving olfactory cues and/or cues encoded and retrieved through taste, as in the famous *madeleine* episode, are a powerful means for transportation into one's own past. In his theory of memory, Proust expounded on the force of such memories and indirectly dared cogni-

tive scientists and neuroscientists to provide an explanation for this phenomenon. This phenomenon, also known as « Proustian Hypothesis »²⁴, was widely discussed and researched by scientists from different disciplines before a psychologist proved Proust right with reference to the physiological make-up of the brain.

Among neuroscientists, cognitive psychologists and philosophers of the mind the fascination with Proust's endlessly introspective text has not abated. With regard to the above, Lehrer even counts Proust among the ranks of neuroscientists : « Proust intuited this anatomy. He used the taste of the madeleine and the smell of the tea to channel his childhood. Just looking at the scalloped cookie brought back nothing »²⁵. Significantly, Kandel also chose Proust's *À la recherche du temps perdu* that is sometimes translated into English as « In Search of Lost Time » as an intertextual foil, while the subtitle of Kandel's autobiography reads « The Emergence of a New Science of Mind »²⁶. But what does this term « New Science of Mind » exactly refer to ?

Kandel has been intimately acquainted with ideas derived from the humanities, especially from the philosophy of mind, since he did not start his academic education as a student of neuroscience, but as a student of history as well as Austrian and German literature, who then became intrigued by psychoanalysis before eventually enrolling in medical school and embarking on a career in neuroscience that earned him the Nobel Prize. Kandel's new science of mind is based on a biological approach to questions traditionally asked by philosophers of mind or treated by literary artists. In his autobiography, Kandel provides a succinct overview of the development in different scientific disciplines – like psychoanalysis, biology and biochemistry and neuroscience – and shows how these disciplines actually joined forces with the humanities in the « new science of mind » in order to explore centuries-old problems from new vantage points: « Indeed, until the end of the Nineteenth century, the only approaches to the mysteries of the human mind were introspective philosophical inquiries (the reflections of specially trained observers on the nature of their own patterns of thought) or the insights of great novelists, such as Jane Austen, Charles Dickens, Fyodor Dostoevsky, and Leo Tolstoy »²⁷. Kandel entertains high hopes with regard to what the new science of mind, or biology of mind, can achieve in its twofold capacity as an experimental as well as applied science. As opposed to the realm of « speculative metaphysics », where hypotheses cannot be properly validated since lacking in empirical evidence,

²⁴ Cf. Jonah LEHRER, *Proust was a Neuroscientist*, Boston, New York, Houghton Mifflin, 2007, p. 80.

²⁵ *Ibidem*.

²⁶ The more common translation is « Remembrance of Things Past ».

²⁷ E. KANDEL, *In Search of Memory*, *op. cit.*, p. 40.

Kandel proposes that « the new science of mind can address philosophical questions that serious thinkers have struggled with for millennia : How does the mind acquire knowledge of the world? How much of mind is inherited ? Do innate mental functions impose on us a fixed way of experiencing the world ? What physical changes occur in the brain as we learn and remember? How is an experience lasting minutes converted to a lifelong memory ? »²⁸.

In order to return to the question posed at the beginning, what impact this oscillation between different disciplines has had on Kandel's self-fashioning, it is pertinent to turn to an anecdote from the history of neuroscience that Kandel relates in his autobiography. The anecdote is about Santiago Ramon y Cajal, who, like Kandel, became a neuroscientist by chance rather than by a definite career plan. Originally, Cajal had artistic inclinations. Jonah Lehrer summarizes Cajal's contribution to the revolution of neuroscience and his method as follows : « Every memory begins as a changed connection between two neurons. This fact was intuited by Santiago Ramon y Cajal, who won the Nobel Prize for Medicine in 1906. Cajal's scientific process was simple : he stared at thin slices of brain under a microscope and let his imagination run wild »²⁹. Cajal's contribution, at the time he first ventured to propose it, was little more than an opinion based on the imaginative method that found a creative solution for a problem that other scientists in the field struggled with : « At the time, scientists assumed that the human brain's neurons were connected in a seamless reticular web, like electrical wires linked in a circuit. Cajal, however, believed that every neuron was actually an island, entirely bounded by its own membrane [...]. [...] Cajal hypothesized that the vacant gaps between cells – what we now call synaptic clefts – were the secret sites of communication »³⁰.

Since Cajal revolutionized neuroscience, Kandel displays great reverence for his achievements, especially a reverence for his unconventional methods, which he developed because of his reduced circumstances, in which he conducted his experiments, and his scientific intuition, born, as Kandel conjectures, of the latter's 'artistic bent'. Thus, Kandel states about his forerunner : « He brought to his task an uncanny ability to infer the properties of living nerve cells from static images of dead nerve cells. This *leap of the imagination*, perhaps derived from his artistic bent, enabled him to capture and describe in vivid terms and in beautiful drawings the essential nature of any observation he made »³¹. The anecdote shows that Kandel places great value on

²⁸ *Ivi*, p. 9.

²⁹ J. LEHRER, *Proust was a Neuroscientist*, *op. cit.*, p. 83.

³⁰ *Ibidem* (my italics).

³¹ E. KANDEL, *In Search of Memory*, *op. cit.*, p. 61.

the role of the artistic imagination in the solving of scientific 'riddles'. Cajal's like Kandel's interdisciplinary education highlights the creative potential inherent in an interdisciplinary approach to a disciplinary problem. In this context, the notion of an interdisciplinary appropriation of or cross-semination of ideas plays an important role. The trajectory the autobiography pursues is that of the self-made man who, like Cajal, comes from a different discipline and, in Kandel's case, also from a foreign country, and has success for these very reasons.

5. Resumee

Kandel's development from an intellectual historian and student of literature into an internationally acclaimed neuroscientist is made feasible by his enduring interest in the many facets of memory, above all in memory as, firstly, culturally and individually expressed forms of remembering the past, and secondly, as a biological and physiological process that stores information about the external world and the past in neural networks, thereby enabling the existence of personal as well as cultural memories in the first place. Moreover, Kandel's example shows quite succinctly that the scientist also functions as a mediator of knowledge. As such it is his task to involve the public in the ongoing scientific discourse. In Kandel's case, the communication of science is intricately bound up with his own personal story of development. His experience points to the close interconnection, even symbiotic relationship between the private life and the scientist's work. Thus, the autobiographical project can also be seen as an attempt to create a personal myth that throws the scientist's personality into strong relief and secures him a strong footing in the formation of public opinion. In Kandel's case, this creation of a personal myth coincides with the prototypical version of the American Dream. Indeed, that he aligns his story with the American Dream provides a kind of additional legitimization to his autobiography and guarantees the autobiography's success in acquiring a readership beyond a circle of readers with an interest in neurobiology.