Swann’s way: Proust as a neurobiologist and neurologist

L. C. Álvaro

Department of Neurology, Hospital Universitario Basurto, Bilbao; Department of Neurosciences, Faculty of Medicine, UPV/EHU, Spain.

ABSTRACT

Introduction and objectives. Marcel Proust is one of the great authors of both 20th century and universal literature. He was no stranger to the scientific breakthroughs of his time (theory of relativity, quantum field theory), or to currents in philosophy (Bergson), psychology (William James), and medicine (Freud). We can therefore expect to find the influence of these disciplines in his works. To this end, we read Swann’s way and extracted and analysed any excerpts related to neurobiology or clinical neurology.

Results. Time and memory are the central themes in this book. The latter functions by means of automatic or involuntary processes. In the creation of memories, sensory elements linked to an emotional factor play a crucial role. The mechanism used by the memory consists of the mental images or representations that constitute consciousness. A deposit or unit of memories is also present. This forms mental reality, which is created inside and projected outwardly, on external objects, echoing what has been learned. A later re-encounter will seem unsatisfactory based on the partial, subjective memories which it evokes.

As for clinical references, the book describes migraines, a variety of conversion disorders, personality disorders, and mental illnesses. The plot also calls for the presence of society doctors, rural doctors, alienists, and surgeons.

Conclusion. We identified the influence of Einstein and Bergson, but not Freud, whose concepts were far removed from Proust’s. These ‘Proustian’ mechanisms have been found to be present in modern disciplines including the extended mind, emotional intelligence, and Damasio’s somatic marker hypothesis. They are also active in the consolidation of memory through synaptic reinforcement and LTP mediation. A final reading from an ethical perspective proposes that individuals survive through art, whether perceived or created.

KEYWORDS
Marcel Proust, medicine, neurology, neurobiology, memory, emotions

Impressionism and science

Marcel Proust (1871-1922) is regarded as a pivotal author in both 20th century and universal literature (Figure 1). His unfinished novel In search of lost time (or Remembrance of things past) possesses the dimensions and solidity of one of those great Gothic cathedrals —also unfinished— that the author so admired.1 The novel is presented in seven volumes; the first was published in 1913, while the last appeared posthumously in 1927, edited by the author’s brother Robert. They function as a fresco or mosaic depicting his time. Like a mosaic, the story grows in concentric circles, with new material that expands the scope of the novel in an elaborate style exercise both cumulative and complex; it recalls Monet’s bold brushstrokes, or the sum of new notes that grow from an opening theme or leitmotif in Ravel’s compositions. The above traits define currents in impressionism, and our author is a distinguished representative of that movement.

Proust’s convoluted prose, with its long uninterrupted sentences, leaves few pauses for its readers2 and provides a clear view of the author and his purpose: to chronicle...
his time. André Gide—who slighted Proust by rejecting his novel while at Gallimard, only to recognise its value at a later date—said that by reading it aloud, one could hear the precisely chosen resonant sounds in the text; no detail was superfluous. But Proust's style is not all-encompassing merely for aesthetic reasons; in fact, it reflects the diverse, rich currents of knowledge flowing in the early years of the 20th century, in psychology, philosophy, science, and medicine. These years saw the emergence of the works of William James, Henri Bergson (Proust's cousin by marriage), Albert Einstein, and Sigmund Freud. Given this historical context, it is fitting that we should find echoes of their fields of study in Proust's novel.

Ever since childhood, he had been frail, sickly, and sensitive, with a tremendous affinity for the arts. While he eagerly received lessons from his mother, who came from a wealthy family and had enjoyed an excellent education in the humanities, Proust did not share interests with his father, a prestigious and influential doctor and epidemiologist. Proust's younger brother Robert became a surgeon, thereby fulfilling their father's wish to pass on his medical knowledge. Nevertheless, medicine is present throughout Proust's novel. It makes its presence known when doctors are included as characters, and in the descriptions of mood, personality disorders, and authentic clinical entities.

In light of the above, reading Proust constitutes a medico-literary and even a neuro-literary journey. In this text, we analyse the first of the seven volumes constituting his magnum opus: Du côté de chez Swann (Swann's way; Figure 2). First, we identify excerpts touching on neurobiological or neuroscientific topics in the original novel in French, from among which we select those of direct medical or clinical interest. The former will reflect the influence of the discoveries of his time, whereas the latter will be proof of Proust's powers of observation and his skill at including medical and clinical information in his character profiles. These data, analysed within their historical context, will provide the means for an interpretation of this novel in which the author shines as a neurobiologist ahead of his time and a skilful clinical observer.

In addition to the excerpts from the original, we have provided the corresponding text from the English version translated by C.K. Scott Moncrieff and published by the University of Adelaide.
Swann’s way: Proust as a neurobiologist and neurologist

Time and memory

The central theme of this novel is time, as its new title informs us: *In search of lost time*. This ‘lost time’ is the past, evoked with profound yearning and emotion by a first-person narrator of whom very little is known, except that he is male, as French grammatical conventions inform us in the very first sentence (*Je me suis couché de bonne heure*). Enmeshed in the society and culture of Proust’s time, and populated by a rich panoply of characters almost all of whom bear some resemblance to the author’s real acquaintances, the novel concludes its long journey in the last volume, *Time regained*. ‘Time lost’ and ‘time regained’ are metaphors for memory, which is shaped and structured in time. There can be no time without memory, nor memory without time. The two concepts intertwine and shape one another until each arises as a separate entity. And since they are in fact separate, as they mingle each leaves a few of its threads behind in the other. As such, intermingled, memory becomes past time retrieved; time becomes sculpted memory. This mixture and interplay means that both are imperfect, momentary reflections or flashes of past instants (time lost) that are transmitted to the present (time regained). What instants are retrieved, how they are evoked —what mechanisms bring them to mind— and lastly, how they influence or reshape our present, are crucial questions that revolve not only around memory (converted to time), but also emotions and consciousness. This is the terrain which the novel explores.

Time, or more accurately the passing of time, is a difficult concept to define. Saint Augustine illustrated its immense complexity in his answer to “What then is time?” in chapter XI of his *Confessions*: “If no one asks me, I know what it is; if I wish to explain it to him who asks, I do not know.” In Proust’s eyes, the past and the future are merely recollections and expectations created by the mind. This places us in what is called cognitive time, which marks how our minds function over the course of a lifetime, and as we think. This is a subjective and specifically human type of time, and it can be manipulated. In contrast to this type is biological time, which results from the activity of biological clocks and is linked to homeostatic functions. It therefore differs from cognitive time in that it is not a product of consciousness, but exists universally in living things and is difficult to manipulate. Another variety of time is cultural in nature; it is an anthropogenic construct...
which, when combined with such instruments as calendars and watches, allows us to measure and specify durations and temporal locations of human activity. Lastly, we find quantum and relativistic time. According to these theories in physics, time is just another dimension of space. It extends across the universe to form the fourth dimension, meaning that we are located within time (space-time). Quantum and relativistic time permits a two-way flow, both forward and backward, and all events are situated (or rather, pre-situated) along this path.9,10

The quantum concept of time and memory is apparent in Proust when he evokes the past as if it were a museum, with memories like a series of paintings together displaying a family resemblance:

... comme s’il en était de notre vie ainsi que d’un musée où tous les portraits d’un même temps ont un air de famille, une même tonalité... 4(p63)

(...as though one’s life were a series of galleries in which all the portraits of any one period had a marked family likeness, the same [so to speak] tonality...)

This concept is expressed even more clearly in the passage on the medieval cathedral at Combray (really Illiers). We find here a specific description of the fourth dimension, corresponding to the time through which the cathedral has travelled, in a triumphant procession through different epochs in addition to the three dimensions of space contained below its nave:

... un édifice occupant, si l’on peut dire, un espace à quatre dimensions — la quatrième étant celle du Temps — déployant à travers les siècles son vaisseau qui, de travée en travée, de chapelle en chapelle, semblait vaincre et franchir, non pas seulement quelques mètres, mais des époques successives d’où il sortait victorieux... 4(p105)

(...a building which occupied, so to speak, four dimensions of space — the name of the fourth being Time — which had sailed the centuries with that old nave, where bay after bay, chapel after chapel, seemed to stretch across and hold down and conquer not merely a few yards of soil, but each successive epoch from which the whole building had emerged triumphant...)

According to Proust, “la réalité ne se forme que dans la mémoire”4(p230) (“reality will take shape in the memory alone”). The only things that he takes seriously and give him joy are those he used to think of while he was roaming the Méséglise and Guermantes ways, and the people he met there.4(p230) If he felt affection for someone, it was simply because that person reminded him of cherished flowers from time past:

Car souvent j’ai voulu revoir une personne sans discerner que c’était simplement parce qu’elle me rappelait une haie d’aubépines, et j’ai été induit à croire, à faire croire à un regain d’affection, par un simple désir de voyage.4(p231)

(For often I have wished to see a person again without realising that it was simply because that person recalled to me a hedge of hawthorns in blossom; and I have been led to believe, and to make some one else believe in an aftermath of affection, by what was no more than an inclination to travel.)

Space, like time, is reconstructed in the memory with all of its content, objects and people, with the precision of “un architecte et un tapissier qui gardent leur ouverture primitive”4(p232) (“as an architect and an upholsterer might do, working upon an original, discarded plan of the doors and windows”). According to this view, space and time form a single reality that merges into memory.

On arriving at this point in the description of memory and time, Proust introduces a distinction that is key to understanding his construct: the difference between voluntary and involuntary memory. However, voluntary memory invoked at will, which he also calls ‘intelligent memory’, is insufficient for the purpose of recovering the past. If this were the only type available, the Combray of his childhood would only exist as a lifeless memory:

Mais comme ce que je m’en serais rappelé m’eût été fourni seulement par la mémoire volontaire, la mémoire de l’intelligence, et comme les renseignements qu’elle donne sur le passé ne conservent rien de lui, je n’aurais jamais eu envie de songer à ce reste de Combray. Tout cela était en réalité mort pour moi.4(p87-88)

(But since the facts which I should then have recalled would have been prompted only by an exercise of the will, by my intellectual memory, and since the pictures which that kind of memory shews us of the past preserve nothing of the past itself, I should never have had any wish to ponder over this residue of Combray. To me it was in reality all dead.)

The process that allows the past to persist and remain as a personal creation is involuntary memory. In building this entirely Proustian concept, with its Freudian resonances although it clearly differs from that neuropsychiatrist’s ideas, the author draws from Celtic mythology. Within that system, the souls of the departed do not vanish; rather, they become locked in another being or an inanimate object. While they remain hidden, only closeness to that object or prison can free them from death and let them live among us once more.
Proust applies the same reasoning to our past:

Il en est ainsi de notre passé. C’est peine perdue que nous cherchions à l’évoquer, tous les efforts de notre intelligence sont inutiles. Il est caché hors de son domaine et de sa portée, en quelque objet matériel (en la sensation qui nous donnerait cet objet matériel), que nous ne soupçonnons pas. Cet objet, il dépend du hasard que nous le rencontrions avant de mourir, ou que nous ne le rencontrions pas. 4(p88)

(And so it is with our own past. It is a labour in vain to attempt to recapture it: all the efforts of our intellect must prove futile. The past is hidden somewhere outside the realm, beyond the reach of intellect, in some material object [in the sensation which that material object will give us] which we do not suspect. And as for that object, it depends on chance whether we come upon it or not before we ourselves must die.)

Through this way of thinking, the author discovers that the common objects linked to his past are the very ones that veil it. Or to be more precise, it is not so much the object as the sensation associated with it. Take Proust’s famous episode with the madeleine, that cake dissolving in tea on his palate that made him tremble with emotion as it evoked his past. He then felt a delicious thrill overcome him, leaving him indifferent to the everyday events in his life and reminding him of the manifestation of love. Thus he discovers that “cette essence n’était pas en moi, elle était moi”, 4(p89) a delightful essence that was not within him, but was rather he himself, or a part of him. As such, the truth of this essence and the past that he sought was not in the potion, but within himself. Buried deep, hidden, and evoked only by this unheralded, casual contact. Furthermore, this process of evoking memory is active and creative; only the sensory stimulus can spark the workings of the mind, which is what finally illuminates the past:

Chercher? pas seulement: créer. Il est en face de quelque chose qui n’est pas encore et que seul il peut réaliser, puis faire entrer dans sa lumière. 4(p89)

(Seek? More than that: create. It is face to face with something which does not so far exist, to which it alone can give reality and substance, which it alone can bring into the light of day.)

The sensations giving rise to this creative process may be taste stimuli, as in the case of the madeleine, but they may also be scents, sounds, or sights (Figure 3). On the subject of visual stimuli, we have also mentioned the association with flowers that created a memory. As for auditory stimuli, an artist as sensitive as Proust could hardly fail to mention music. There are repeated references to the “little phrase by Vinteuil”, a musical theme that historians have identified as a reference to a piano sonata by César Franck, a contemporary of Proust’s whom he admired. 4(p239) As he listens to the slow rhythm of a musical backdrop, the protagonist compares it to drawing, architecture, or thought, it suddenly seems to give way to a new, quicker, and melancholy movement that opens previously unseen perspectives, in a process once again compared to love:

Figure 3. Images of triggers evoking automatic memory: madeleine cakes shaped like scallop shells, as described in the book (left), hawthorn boughs (aubépine, centre), and César Franck at the organ (right). The Vinteuil sonata in the novel is based on a sonata for violin and piano by Franck.
Swann associates this musical phrase with his love for Odette, when it withers and he believes it is lost. But the previously described sensations of taste, and smell above all, are what act upon automatic memory. As if he had intuited the presence of the reptilian brain and limbic system that are linked to these primitive sensations, Proust finds that association between scent and recall is the most persistent and long-lasting link used in evoking and recording memory. For example, breathing in the scent of the varnish from the staircase in his childhood home in Combray reminded him of his mother waiting so anxiously in the room above. That smell was linked to home in Combray reminded him of his mother waiting such a deep-seated, immediate, toxic, and inevitable rush of sadness that it overcame his ability to think.

Cet escalier detesté où je m’égagaiais toujours si tristement, exhalait une odeur de vernis qui avait en quelque sorte absorbé, fixé, cette sorte particulière de chagrin que je ressentais chaque soir, et la rendait peut-être plus cruelle encore pour ma sensibilité parce que, sous cette forme olfactive, mon intelligence n’en pouvait plus prendre sa part. […] mon chagrin de monter dans ma chambre entrait en moi d’une façon inénarrablement plus rapide, presque instantanée, à la fois insidieuse et brusque, par l’inhilation—beaucoup plus toxique que la pénétration morale—de l’odeur de vernis particulière à cet escalier.4(p71)

(That hateful staircase, up which I always passed with such dismay, gave out a smell of varnish which had to some extent absorbed, made definite and fixed the special quality of sorrow that I felt each evening, and made it perhaps even more cruel to my sensibility because, when it assumed this olfactory guise, my intellect was powerless to resist it…my anguish at having to go up to my room invaded my consciousness in a manner infinitely more rapid, instantaneous almost, a manner at once insidious and brutal as I breathed in—a far more poisonous thing than any moral penetration—the peculiar smell of the varnish upon that staircase.)

The strength of the similar sensations of smell and taste was such that Proust believed them to be the only means of sensory perception and memory remaining when all others have been destroyed. The survivors of the ruin of time and memory, they alone remain to give shape to the edifice of recollection:

Mais, quand d’un passé ancien rien ne subsiste, après la mort des êtres, après la destruction des choses, seules, plus frêles mais plus vivaces, plus immatérielles, plus persévérantes, plus fidèles, l’odeur et la saveur restent encore longtemps, comme des âmes, à se rappeler, à attendre, à espérer, sur la ruine de tout le reste, à porter sans fléchir, sur leur goutte presque impalpable, l’édifice immense du souvenir.4(p91)

(But when from a long-distant past nothing subsists, after the people are dead, after the things are broken and scattered, still, alone, more fragile, but with more vitality, more unsubstantial, more persistent, more faithful, the smell and taste of things remain poised a long time, like souls, ready to remind us, waiting and hoping for their moment, amid the ruins of all the rest; and bear unaltering, in the tiny and almost impalpable drop of their essence, the vast structure of recollection.)

We see here how memory is formed over time. It occurs on the basis of experiences that are activated unconsciously, especially by means of different types of sensory mechanisms. Another trait of this type of memory is how it is formed: after a series of experiences, the memory unit becomes strengthened, organised, and distinctive:

… cette cohésion, cette unité qui n’appartiennent qu’aux créations de notre esprit…4(p160)

À cause de la solidarité qu’ont entre elles les différentes parties d’un souvenir et que notre mémoire maintient équilibrées dans un assemblage où il ne nous est pas permis de rien distraire, ni refuser…4(p75)

(… that cohesion, that unity which belongs only to the figments of the mind…)

Because of the solidarity that binds together the different parts of a general impression, parts that our memory keeps in a balanced whole, of which we are not permitted to subtract or to decline any fraction…)

Memory, shaped and consolidated by these means, becomes entrenched in our minds, a living active entity. We have only to absorb the stimuli of the present, and let them distract us, for a memory to burrow into our consciousness:

Mais depuis peu de temps, je recommence à très bien percevoir si je prête l’oreille, les sanglots que jésus la force de contenir devant mon père et que
éclatèrent que quand je me retrouvais seul avec maman. En réalité, ils n’ont jamais cessé; et c’est seulement parce que la vie s’est maintenant davantage autour de moi que je les entends de nouveau, comme ces cloches de couvents que couvent si bien les bruits de la ville pendant le jour qu’on les croirait arrêtées mais qui se remettent à sonner dans le silence du soir.\(^\text{[81p]}\)

(But of late I have been increasingly able to catch, if I listen attentively, the sound of the sobs which I had the strength to control in my father’s presence, and which broke out only when I found myself alone with Mamma. Actually, their echo has never ceased: it is only because life is now growing more and more quiet round about me that I hear them afresh, like those convent bells which are so effectively drowned during the day by the noises of the streets that one would suppose them to have been stopped for ever, until they sound out again through the silent evening air.)

The author is quite aware of the limitations of this memory: searching for reality in the portraits painted by memory is intrinsically contradictory. They are merely partial sketches, minimal fragments of a multitude of stimuli and sensations of a moment that correspond neither to the true complexity of the past nor (alas!) to stimuli and sensations of a moment that correspond neither to the true complexity of the past nor (alas!) to the present. If we wish to locate a trace of this past in the current space and time, we discover, with deep dejection, that they do not exist, but were merely errant figments of the present. If we wish to locate a trace of this past in the current space and time, we discover, with deep dejection, that they do not exist, but were merely errant figments of thought. This is the precise message contained in the last paragraph of the book:

Les lieux que nous avons connus n’appartiennent pas qu’au monde de l’espace où nous les situons pour plus de facilité. Ils n’étaient qu’une mince tranche au milieu d’impressions contiguës qui faisaient notre vie d’alors; le souvenir d’une certaine image n’est que le regret d’un certain instant; et les maisons, les routes, les avenues, sont fugitives, hélas! comme les années.\(^{[476]}\)

(The places that we have known belong now only to the little world of space on which we map them for our own convenience. None of them was ever more than a thin slice, held between the contiguous impressions that composed our life at that time; remembrance of a particular form is but regret for a particular moment; and houses, roads, avenues are as fugitive, alas, as the years.)

Representations: images and consciousness

If memory is the mental receptacle of recollections in space and time, and also has the ability to create them using specific and limited sensory information, the question remaining is what mechanisms it uses to do so. We know that the strongest triggers of recall are certain stimuli corresponding to the type of memory called involuntary memory. When these stimuli are repeated, they will make up a unit or coherent group which, over time, will form a mental reality that is is subjective and unique. The above occurs because of our ability, on the one hand, to form mental images; and on the other, to link those images to content that we ourselves find emotionally relevant. In this way, the mental images of specific stimuli come together on their own because they are linked to something emotionally significant. Without this link, or without the ability to generate the image, memory would not be possible. Time would be lost and never regained. In contrast, when the experiences we live are also felt, a genuine search for past time can be undertaken, and in this process, time is regained. This is the essence of what we might call the physiology of Proustian memory. We will illustrate it, step by step, using his own text.

Images are already addressed in Proust’s influential descriptions of the madeleine and the evocative power of its flavour:

Certes, ce qui palpite ainsi ou fond de moi, ce doit être l’image, le souvenir visuel, qui, lié à cette saveur, tente de la suivre jusqu’à moi.\(^{[90]}\)

(Undoubtedly what is thus palpitating in the depths of my being must be the image, the visual memory which, being linked to that taste, has tried to follow it into my conscious mind.)

But it is when he describes learning from books, and how they have influenced him, that he most clearly discovers the ability of images to form memory. When this occurs, it is because they are linked to an intense emotional experience. The image of what the first-person narrator has experienced, or rather read in this case, provoking vivid sensations, becomes a part of that person’s mind. Objects, space, time, and emotions are what come together to form his reality. And this intimate, inward-looking reality will then be projected outwardly in a process that will in the end transmit the contents of the memory that it forms — the mental reality of the self— to external objects, as this mental reality searches for itself unconsciously and automatically. The text provides an example:

Mais tous les sentiments que nous font éprouver la joie ou l’infortune d’un personnage réel ne se produisent en nous que par l’intermédiaire d’une image de cette joie ou de cette infortune…\(^{[129]}\)

(But none of the feelings which the joys or misfortunes of a ‘real’ person awaken in us can be awakened except through a mental picture of those joys or misfortunes...)
The author himself believes that a novelist’s genius lies in discovering that the image is the essential part of the emotional experience.

… l’ingéniosité du premier romancier consista à comprendre que dans l’appareil de nos émotions, l’image étant le seul élément essentiel, la simplification que consistait à supprimer purement et simplement les personnages réels serait un perfectionnement décisif. […] Qu’importe dès lors que les actions, les émotions de ces êtres d’un nouveau genre nous apparaissent comme vraies, puisque nous les avons faites nôtres, puisque c’est en nous qu’elles se produisent...

(...The novelist’s happy discovery was to think of substituting for those opaque sections, impenetrable by the human spirit, their equivalent in immaterial sections, things, that is, which the spirit can assimilate to itself. After which it matters not that the actions, the feelings of this new order of creatures appear to us in the guise of truth, since we have made them our own, since it is in ourselves that they are happening...)

The image that is created is not always visual, but rather a mental projection of objects or events with emotional content, regardless of the type of sensory stimulus linked to them. It is through these mental projections that our consciousness forms as we get to know ourselves and the outside world. In turn, representations of the consciousness will constantly radiate outward from the self. This occurs not only in emotionally stimulating literature, as previously mentioned—

… pendant ma lecture, exécutait d’incessants mouvements du dedans au dehors, vers la découverte de la vérité...

(...while I was reading, would be constantly a motion from my inner self to the outer world, towards the discovery of Truth...)

—but also in the everyday life of the narrator:

Enfin, en continuant à suivre du dedans au dehors les états simultanément juxtaposés dans ma conscience...

(And then, as I continue to trace the outward course of these impressions from their close-packed intimate source in my consciousness...)

In this way, as the author states, one searches within things to find the reflections we have projected on them:

On cherche à retrouver dans les choses, devenues par là précieuses, le reflet que notre âme a projeté sur elles...

(We try to discover in things, endeared to us on that account, the spiritual glamour which we ourselves have cast upon them...)

The sonority, flavour, and reflection of things thus cannot be attributed to echoes from the outside, but rather to resonances of our own private burdens. Earlier, we mentioned the Celtic belief that forgotten souls can be hidden in objects and awakened to evoke memory. Now, with the memory formed and conscious, the movement is inverse, from consciousness to objects. As occurs with memory —so often viewed as a fleeting disappointment when compared with the real sensory richness of the present— we now find the discouragement of finding that objects lack the lustre provided by our own ideas. This is necessarily so, given that memories are subjective and generated from personal, unique representations and emotions:

… on est déçu en constatant qu’elles semblent dépourvues dans la nature, du charme qu’elles devaient, dans notre pensée, au voisinage de certaines idées...

(...we are disillusioned, and learn that they are in themselves barren and devoid of the charm which they owed, in our minds, to the association of certain ideas...)

As slaves to our senses, and to our subjective and therefore biased emotions, our mental representations, memory, and outward projections often lead us to question the reality that the new information or experience provides:

… nous en sommes réduits à celui de nos sens dont nous nous demandons, devant ce souvenir isolé et incohérent, s’ils n’ont pas été le jouet d’une illusion...

(...we are reduced to the evidence of our own senses, and we ask ourselves, in the face of this detached and incoherent fragment of recollection, whether indeed our senses have not been the victims of a hallucination...)

Proust, believing that reality is formed in the memory, was aware of the limitations intrinsic to the imperfect mechanisms of consciousness described above. Nevertheless, the author knew that only through sensitivity and emotion can the sentimental baggage we acquire improve our wretched human condition. Once captured, these acquisitions become a permanent part of our minds, and as such, they will be bound to our fate even in death. Thanks to their presence, death will be less bitter, and even less likely, because we will live on in the values intrinsic to the sentiments we internalise. Proust
cites the example of Vinteuil’s phase to describe this concept, and the overarching lesson implicit in the novel is that art acts as a saviour that triumphs over nothingness:

Par là, la phrase de Vinteuil avait, comme tel thème de Tristan par exemple, qui nous représente aussi une certaine acquisition sentimentale, épuisé notre condition mortelle, pris quelque chose d’humain qui était assez touchant. Son sort était lié à l’avenir, à la réalité de notre âme dont elle était un des ornements les plus particuliers, les mieux différenciés. Peut-être est-ce le néant qui est le vrai et tout notre rêve et-il inexistant, mais alors nous sentons qu’il faudra que ces phrases musicales, ces notions qui existent par rapport à lui, ne soient rien non plus. Nous périrons, mais nous avons pour otages ces captives divines qui suivront notre chance. Et la mort avec elles a quelque chose de moins amer, de moins inglorieux, peut-être de moins probable.\(^{(398)}\)

(In that way Vinteuil's phrase, like some theme, say, in Tristan, which represents to us also a certain acquisition of sentiment, has espoused our mortal state, had ended a vesture of humanity that was affecting enough. Its destiny was linked, for the future, with that of the human soul, of which it was one of the special, the most distinctive ornaments. Perhaps it is not-being that is the true state, and all our dream of life is without existence; but, if so, we feel that it must be that these phrases of music, these conceptions which exist in relation to our dream, are nothing either. We shall perish, but we have for our hostages these divine captives who shall follow and share our fate. And death in their company is something less bitter, less inglorious, perhaps even less certain.)

Doctors and neurological references in Proust

Proust’s novel contains a long list of characters from his epoch. Doctors are among them, which is not surprising given that the author was chronically ill and both his brother and father were doctors. As in Balzac, whom Proust greatly admired, and somewhat later in Spanish literature with Galdós,\(^{(11)}\) the same characters appear in different parts of the story with different attributes to advance new developments in the plot. Where we find Dr Miquis in Galdós, Proust presents Dr Cotard. Dr Cotard makes his entrance in Swann’s way, which we stress is the sole volume analysed here, in Mme Verdurin’s Parisian salon. This becomes a key location in the novel in the opening pages of the second volume (In the shadow of young girls in flower). It is not difficult to see the image of Proust’s own father and his dealings with the Parisian nobility of the time. Dr Cotard attended an upper-class clientèle, making him very different from the rural doctors mentioned in the first volume, in Combray. As was typical in that setting and moment in history, ladies often suffered from headaches and strange pains and symptoms suggesting what we now call conversion disorder, and they used them to draw the attention and compassion of others. As soon as she appears in the novel, Mme Verdurin describes what she calls her migraines to guests including Dr Cotard (a young doctor then just starting his practice):

Alors vous tenez à ce que j’aie ma migraine? Vous savez bien que c’est la même chose chaque fois qu’il joue ça. Je sais ce qui m’attend! Demain quand je voudrai me lever, bonsoir, plus personne!\(^{(236)}\)

(Then you want me to have one of my headaches? You know quite well, it’s the same every time he plays that. I know what I’m in for. Tomorrow, when I want to get up — nothing doing!)

At another gathering, she reminds us of her pains: “un rhume de cerveau avec névralgies faciales... on voit bien que ce n’est pas vous qui garderez le lit huit jours\(^{4(p265)}\)”

(“...a cold in the head, and neuralgia all down my face... it is easy to see that none of you will have to stay in bed, for a week”). Such terms as “cold in the head” or even “cerebral rheumatism” were often used in those times since migraines were attributed to changes in the blood and CSF dynamic and frequently associated with other rheumatic pains; today, such patients would probably be diagnosed with fibromyalgia.

Another of the main characters, Swann’s beloved Odette, also complains of headaches. Characteristically, she does so during a tense exchange with Swann, displaying a good-sized dash of victimhood that Swann himself detects:

... elle se sentait mal à la tête [...] et, peu après, elle se sentait fatiguée et désirait s’endormir. [...] l’idée lui vint brusquement que peut-être Odette attendait quelqu’un ce soir, qu’elle avait seulement simulé la fatigue...\(^{(320)}\)

(…her head ached…a little while later she felt tired and wished to sleep….the idea suddenly struck him that, perhaps, Odette was expecting some one else that evening, that she had merely pretended to be tired…)

Continuing with the subject of headaches that arise in emotionally charged or conversive contexts, we find those affecting Aunt Leonine of Combray, the alter ego of the writer’s aunt with whom he spent his summers in the town known later as Illiers-Combray. Proust’s description of his aunt’s ailments is rambling but quite detailed. She clearly displays histrionic traits, including being a bedridden, dependent recluse with no defined reason or infirmity, and systematically manipulating all
around her. We will not cite the passages about Leonine's illness due to their length, but they mention her headaches, hypersensitive skin, and particularly her aversion to noise (Figure 4), as well as her skill at using these symptoms to win the attention of her servants and family members.

Elle ne parlait jamais qu'assez bas parce qu'elle croyait avoir dans la tête quelque chose de cassé et de flottant qu'elle eût déplacé en parlant trop fort [...] puis, dans linertie absolue où elle vivait, elle prenait à ses moindres sensations une importance extraordinaire [...] elle se les annonçait à elle-même, en un perpétuel monologue qui était sa seule forme d'activité. 4(p94)

(She never spoke save in low tones, because she believed that there was something broken in her head and floating loose there, which she might displace by talking too loud...besides, in the life of complete inertia which she led she attached to the least of her sensations an extraordinary importance...she used to promulgate them to herself in an unceasing monologue which was her sole form of activity.)

The father of the child narrator in Combray also suffered from migraines, which he treated using the time-honoured remedy of knotting a scarf around his head 13:

On ne pouvait pas remercier mon père [...] il était encore devant nous, grand, dans sa robe de nuit blanche sous le cachemire de'Inde violet et rose qu'il nouait autour de sa tête depuis qu'il avait des névralgies...4(p80)

(It was impossible for me to thank my father...he was still confronting us, an immense figure in his white nightshirt, crowned with the pink and violet scarf of Indian cashmere in which, since he had begun to suffer from neuralgia, he used to tie up his head...)

Cottard acknowledged the existence of certain neurasthenic states ("il y reconnaissait certains états neurasténiques") although he was not strict about his prescriptions whenever he took part in social gatherings in which these patients were often present. Neurasthenic states are by no means the only entities mentioned in the novel. Proust also includes other personality disorders of the type already referred to as 'neurotic', or more generically as 'neuropathic'. These terms derive from 'neurosis', that is, a non-inflammatory affection of the nerves. Pinel distinguished between relational neuroses and neuroses of private life and the emotions. 14 'Excessive moral affections' was listed among their causes. Proust's description of Swann's jealousy falls neatly into this category, as Swann becomes an obsessive neuropath and suffers to the point of wishing for a 'real disease' to free him from his neuropathic symptoms:

C'est charmant, je deviens névropathe. [...] Cette nécessité d'une activité sans trêve, sans variété, sans résultats, lui était si cruelle qu'un jour, apercevant une grosseur sur son ventre, il ressentit une véritable joie à la pensée qu'il avait peut-être une tumeur mortelle, qu'il n'allait plus à s'occuper de rien, que c'était la maladie qui allait le gouverner, faire de lui son jouet, jusqu'à la fin prochaine. Et en effet, si à cette époque, il lui arriva souvent sans se l'avouer de désirer la mort, c'était pour échapper moins à l'acuité de ses souffrances qu'à la monotonie de son effort. 4(p364-365)

("This is delightful; I'm becoming neurasthenic"... This compulsion to an activity without respite, without variety, without result, was so cruel a scourge that one day, noticing a swelling over his stomach, he felt an actual joy in the idea that he had, perhaps, a tumour which would prove fatal, that he

![Figure 4. Images of Illiers (left), known today as Illiers-Combray to reflect the name Proust gave to this medieval town in his fictional account. Between the ages of 6 and 9 years, he spent his summers here with his aunt and uncle on his father's side (Jules and Elisabeth). The latter is portrayed in his novel as aunt Leonie (right), who suffers from conversion symptoms and severe migraines. It was in this house where the writer tasted the famous madeleine.](image-url)
need not concern himself with anything further, that it was his malady which was going to govern his life, to make a plaything of him, until the not-distant end. If, indeed, at this period, it often happened that, though without admitting it even to himself, he longed for death, it was in order to escape not so much from the keenness of his sufferings as from the monotony of his struggle.)

In a later passage, when speaking of his rival for Odette (M. de Charlus), he calls him a neuropath, a term he uses interchangeably with the more specific concept 'neurotic'. At this junction, he introduces the concept of fellow-feeling as a counter to his ill-wishes for M. de Charlus, and it is his empathy that will triumph:

… c'est la bonté, qu'il ne pouvait au fond répondre que de natures analogues… 4(p405)

(...)what prevents men from doing harm to their neighbours is fellow-feeling, that he could not, in the last resort, answer for any but men whose natures were analogous to his own...

The author presents yet another moral lesson: intelligence as a synonym of empathy. He goes on to state that if highly intelligent individuals are respected, it is not for their knowledge, which is not usually well-understood, but rather for their goodness. Today, we might use the term 'emotional intelligence'. Proust describes the face of goodness as that of a busy surgeon, showing no trace of tenderness, and hiding true empathy behind a serious façade. In this passage, the author highlights the importance of judging people by their deeds, and not their words or mere appearances; other examples appear throughout the text.

… des incarnations vraiment saintes de la charité active, elles avaient généralement un air allègre, positif, indifférent et brusque de chirurgien pressé, ce visage où ne se lit aucune attendrissement devant la souffrance humaine, ce visage où ne se lit aucune commisération, aucun attendrissement devant la souffrance humaine, aucune crainte de la heurter, et qui est le visage sans douceur, le visage antipathique et sublime de la vraie bonté. 4(p127)

(...literally saintly examples of practical charity, they have generally had the brisk, decided, undisturbed, and slightly brutal air of a busy surgeon, the face in which one can discern no commisération, no tenderness at the sight of suffering humanity, and no fear of hurting it, the face devoid of gentleness or sympathy, the sublime face of true goodness.)

This goodness stands in contrast to the total lack of empathy in those people displaying destructive and toxic behaviours toward those nearest to them as they seek to further their self-interests. An example would be Mlle Vinteuil, referred to as a sadist in the text. Today, she would be regarded as a psychopath.

Peut-être n'eût-elle pas pensé que le mal fût un état si rare, si extraordinaire, si dépaysant, où il était si reposant d'émigrer, si elle avait su discerner en elle, comme en tout le monde, cette indifférence aux souffrances qu'on cause et qui, quelques autres noms qu'on lui donne, est la forme terrible et permanente de la cruauté. 4(p210)

(Perhaps she would not have thought of wickedness as a state so rare, so abnormal, so exotic...had she been able to distinguish in herself, as in all her fellow-men and women, that indifference to the sufferings which they cause which, whatever names else be given it, is the one true, terrible and lasting form of cruelty.)

These characters are described as "threatened with the loss of [...] reason" 4(p262) and as is only fitting, they call on mad-doctors and alienists, whom Proust describes as having professional habits that include being able to call patients to order with a word and a gesture. 4(p65) Together with surgeons, rural doctors, and high society physicians, these characters populate Proust's world and make it vivid. Without them and their characterisations, the text would lose some of its richness. There can be no question that Proust's complete works, and not just the volume examined here, deserve an analysis of the medical, neurological, and clinical references they contain.

Influences and neurobiological scope

Proust's conjectures about time and memory have been supported by modern neuroscience. For example, the idea of outward projection of the contents of the memory has been closely echoed by modern theories on the extended mind as proposed by Clark and Chalmers in 1998. 15 According to these authors, cognition, rather than being limited by the definite boundaries of brain and skin, is not strictly Cartesian or even mental. It stretches beyond those confines by means of devices ranging from paper and pencil to the most sophisticated gadgets, whether external or internal, such as the prosthetic devices that can be inserted in the brain to aid with such functions as memory and seeing movement. This type of cognition can be transmitted, especially through language, and in doing so it becomes social or cultural cognition, which is expressed in a variety of ways. 16 On a practical level, the rise of artificial intelligence and robotics is also based on postulates for interaction with the environment, memory, Bayesian learning mechanisms, and perfecting new interactions. 17 Proust
recognises the limits of outward projection of consolidated memory, and a deeper reading shows this concept to be similar to the form of extended cultural cognition known as art.

His conception of time as a duration and a transformation into memory was clearly influenced by Bergson. Proust was an excellent scholar of philosophy from a young age; he had brilliant professors and his keen interest in this field shines through in his novel and his voluminous correspondence. Henri Bergson was Proust's cousin, but he never showed any particular interest in the latter, and the two were not close. He did recall Proust as "the cousin who once gave me some excellent wax earplugs". The central Bergsonian idea of persistence in time, seen as both a flow and a duration into which both ideas and beings will merge, is discernible in Proust's projections of memory, both those moving inward to create memory and those moving outward to mould the external world and the creations of the mind. Based on these reflections on the displacement and plasticity of the memory in time and space, we believe that Proust followed in the wake of Bergson's philosophy. Not all scholars agree, however, probably because Proust never confirmed this.

Proust's references to the automatic memory and the conscious or intellectual memory suggest that he may have been swayed by Freud, another of his contemporaries. The above terms evoke the concepts of the conscious and subconscious mind, and the impact of the elements making up the subconscious mind. Nevertheless, an in-depth analysis shows that Proust's ideas have nothing to do with the impulses that Freud regarded as an essential part of the mind and conduct, whether individual or social. On the contrary, Proust remained convinced that impulses have very little influence on the results of our actions. The decisive factor in actions that Proust regards as transcendent, such as complying with moral obligations, showing loyalty to friends, or completing a project, is one's acquired habits, that is, consolidated memory and the reality of that memory determine behaviour and its results. Some say Proust never read Freud's works. Furthermore, while Freud was exploring the subconscious layers of the mind as an exercise in psychopathology, Proust's exercise was in aesthetics. An eclectic survey of these two authors might describe them as complementary.

Proust's mechanism for the creation of memory from images linked to emotions is particularly intriguing. We feel that it is in line with modern theories of emotional intelligence, especially the somatic marker hypothesis. Damasio, the author of this hypothesis, shows the influence of Spinoza—another thinker of Portuguese origin—in his theories. While the similarities between these scholars cannot be denied, analysing them is not within the scope of this paper, and we prefer to highlight the coherence between Damasio's and Proust's ideas. In both views, images are the most common form of mental representation; here, the term 'image' refers not only to visual representations, but also those proceeding from the other senses and to conceptual or semantic representations. Proust recognises that the emotion linked to objects or situations plays an essential role, thereby allowing them to generate memory and what he calls mental reality. This mental function is similar to what Damasio calls 'emotionally competent stimuli'. Such stimuli are responsible for an image representation sequence and a neuro-humoral response that constitutes what he terms the somatic marker. The somatic marker is expressed in a rapid, pre-conscious manner and then followed by conscious emotion, which gives way to the motor or behavioural response pertaining to that emotion. This sequence displays similarities to automatic memory that invades the conscious mind given an emotional trigger, and may be followed by recognition of an object or external sequence linked to that trigger, as seen in Proust.

With so many references to memory, we cannot overlook what Proust calls consolidation and cohesion, or internal unity. This very mechanism is what forms memory. In fact, a learning process linked to emotions is what permits the consolidation and retrieval of what will later become memories. This sequence has been confirmed by our modern knowledge of neuroscience, which establishes that memory is formed and consolidated through synaptic reinforcement. This entails an increase in the number of synaptic connections in space and time, and this process occurs thanks to long-term potentiation (LTP). LTP in turn is initiated by neurochemical mediators such as KREBB proteins or NMDA receptors activated by glutamate. As we know now, Proust's conjecture, the link between memory and emotion, underlies not only normal learning, but also pathological phenomena including post-traumatic stress syndrome. Knowledge of these neurochemical pathways allows scientists to test receptor inhibitors such as cycloserine, or substances like anisomycin that block mediator proteins, in animal models and in clinical medicine.

**Conflicts of interest**
The author has no conflicts of interest to declare.
Swann’s way: Proust as a neurobiologist and neurologist

References