The Principles of Psychology

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William James *magnus opus* is not a presentation of psychology as it is generally conceived of by the public, thus in particular not a therapy for feeling good. It is a philosophical treatise on the phenomenon of consciousness, and apart from a few empirical references interspersed in the text, the main method employed is that of introspection, thus tapping into a pool of experiences potentially shared by most readers. As it was published back in 1890, and thus, just as in Freuds psychological pathologies, those introspections give idyllic insights into the charming everyday life available back then to a professor. There are no cars, no telephones, no personal computers. No references to world wars and human atrocities. The streets are filled with the clatter of horses, letters are carefully written, and many women are hysterical.

James is an avowed materialist when it comes to the matter of consciousness, which at the time was far from non-controversial. He anchors his inquiry in the biological fact of a brain, starting out his book by a reference to some rather cruel experiments of vivisection. Just as Laplace did not need the hypothesis of God, James can do without the Soul. Not because he claims he can refute the existence of a Soul, on the contrary, he admits that the assumption of a Soul would avoid many logical pitfalls; but because such a hypothesis would be scientifically unfruitful, in particular have no explanatory potential. In modern language we would say that the hypothesis of a Soul would be non-falsifiable. One would think that a book on psychology over a hundred years old would be hopelessly dated. There is no mention of Freud, nor any conception of modern neurological research using sophisticated technology; still in view of the renewed interest into the phenomenon of consciousness, the work of James is more topical than ever before, and appears far more modern than many other treatises far more recent. The reason is that James approach is philosophical and he does not lose sight of the central topic - consciousness, which is pursued with tenacity and common sense. The text itself is non-technical but densely written, sober and refreshingly free of the kind of vulgar jocularity marring so many modern presentations. Furthermore studded with references, often spelled out as lengthy quotations, almost exlusively from German, French and Anglo-Saxon sources; as well as finely printed footnotes, some of them swelling into pages. It is addressed to the general educated public, making few concessions to ignorance and lack of intellectual sophistication, thus earning the reciprocal respect of the serious reader.

The brain has an evolutionary history, stretching almost as far back as the origin of life itself. Its purpose is to co-ordinate nerve impulses, of which movements are the most obvious manifestations. As noted above, a few cruel experiments on animals set the stage. In fact for frogs and birds most of the brain tissue can actually be excised without seriously

affecting at least the viability of the animal[1], although this depends very much on the skill of the experimenter; and if the truncation is limited to the cerebral hemispheres frogs and birds are able to perform all the movements required for their survival to perfection, but careful observation reveals that while motoric skill may be unimpaired, the purpose of it is no more. Such mutilated animals appear listless and automatic in their movement, initating nothing, doing nothing unpredictable. Eating when presented with food, but making no effort to obtain it; copulating when given the opportunity, but endeavouring no pursuit of their own. Clearly it is in the gray matter the interesting things happens, and for higher animals, among which men clearly belong the vanguard, it is even more so, as neurological centralization tends to become more and more accentuated with greater mental sophistication[2].

Still, even if the matter of thinking has a clear biological and evolutionary basis as seen from without, its most interesting aspect is when seen from within, and then it becomes the most immediate and basic of existence itself, as expressed by the famous dictum of Descartes. We know our thoughts, but knowing them is not the same thing as having them, and James points out over and over again the 'psychologists fallacy' of failing to do the distinction, to confuse the thought itself with its object, to put into it more than there is, as well as subtracting from it what rightfully belongs to it. A thought is a thought, and of course thinking of it changes it, making the thinking of thinking logically circular, an awareness never to be lost sight of, making the subject so subtle as well as compellingly interesting.

What is the self? In one of the books most accessible, if least sophisticated and original chapters, the delineation of the self is mapped out. There are many circles, the wider we draw them, the less essential they seem to us to be. Innermost there is the core identity, the entity that thinks the thoughts, makes the decisions, has volition, the central agent in consciousness. Our body is ours, some of it more than others. A leg can be dispensed of, it does in no way affect our core, but indirectly; and once removed it becomes as estranged from us as the wooden leg of a chair. Clothes constitute the extension of the body, and when fashion is allowed to go rampant, the distinction gets blurred, as noticed in the ancient tradition of footbinding in China, the old fad for waspy waists and finally in the modern craze for breast transplants in particular and cosmetic-surgery in general. But our self extends beyond our body and the purely corporeal. Our closest of kin are seen as bodily extensions of ourselves, and our reputations, our wealth and possessions, as well as our powers of intellect, artistry and influence, not to forget our skills and gifts, become almost indivisible components of our sense of self-regard and the way we view ourselves as social figures. Such musings are, as noted above, not particularly original, and have been expressed with even greater aplomb by such philosophers as Schopenhauer, and not to

[1] We all know the stories of decapitated poultry running around for some time, although few of us have actually watched the spectacle

[2] True to the tenor of his times, James is unabashedly hierachial in his judgements. He distinguished different levels of men. On the lowest rung is the tramp living from hour to hour, slightly above him the Bohemian, who lives from day to day, then follows the bachelor who lives for his life, as opposed to the father, who lives for the generation to succeed him. Highest we find the scientist and the saint, who live and plan for generations to come onto eternity

mention in its implicit aspects, treated by countless novelists of the day; and does provide much of the meat of contemporary psychology. However James makes some interesting observations. First he notes that we love ourselves and what is intimately connected to us, not because it is ours per se, but because we know it best. Thus he denounces the stoic attitude, heroic as it may be, because it really entails a shrinking of the self, and are thus only to be seen in natures ungenerous and barren. The more we extend ourselves, the more likely are we to suffer and feel hurt. Only the wilted plant can be mowed down with no agony[3].

Central to James is of course consciousness, but part of our mental life there are parts similar to those of legs and arms of the body; not conscious, somehow outside ourselves and thus amendable to amputation. The notion is of course the one of habit. Habits are really automatic behaviour, whether instinctively learned or deliberately acquired. To the materialist James they correspond to perfected neurological path-ways of the brain, being fired off in quick succesion without conscious intervention. Literally without habits life would be impossible, our day to day functioning is in fact made possible by the countless habits on which we ride. Habits save us from the agonies of decision that are invariably slow and exhausting. Thus the succesful life rests on having many good habits, and James paints the pathetic condition of the individual whose 'only' habit is indecision, who wastes most of his life on minor matters, what cigar to smoke, what cup to choose for drinking, when to go to bed. To an intellectual like James, as much as possible of your waking hours should be devoted to higher mental activity, and the humdrum of life regulated to automation. When James expounds on the matter of habits, he loses his exalted universality and descends into specific provinciality. He notes that personal habits are formed before twenty, that professional habits before thirty, thus sketching an educational vision, in which the tender years should be devoted to character building and your twenties to the perfection of your professional skills. The unbred character, even if attaining spectacular financial success, will never, according to James, acquire the habit of good and proper clothing to his dying day, just as a foreign speaker will never be able to rid himself of his accent. Furthermore it is the force of habit that keeps society together. Without habit would the poor stick to the drudgery of their lives performing the necessary chores that needs to be done? Finally habit for James is one end of a continous spectrum reaching from man, through the instincts of lower animals, to the iron-clad laws of inanimate matter. A habit so strong as to become fixed into inflexible instinct is a dangerous thing. Just imagine if we would never be able to pass up an opportunity to eat or to copulate, would it so entail an immediate threat to our lives.

I believe that it is James who actually coined the notion of the stream of consciousness, which acquired such a central place in experimental fiction a few decades later. How do we recognise our thoughts as our own? And if so what does it really mean? James paints the simile of cattle on the range, each one with its own marking defining ownership. Thus consciousness renews itself continously, recognising its own thoughts by their 'warmth' taking over ownership from the preceding consciousness. Yet due to each thought having a 'fringe' the sensation is one of continuity, not of a discrete sequence. Such ideas to be taken up later in the experience of time.

[3] The last sentence is not to be found in James, being only an elabouration of his general drift

At the time of James, hysteria was a common diagnosed phenomenon, assumed to allow windows into the mind, as was the popular method of hypnosis. In fact James appears even to take a rather agnostic attitude towards spiritualism, which was rampant at the time. The interesting thing is of multiple consciousness, and James refers to a few reported cases, of alternating states of consciousness in the one and the same individual, each of them being unaware of the other, just like a sequence of dreams, in which the memory of the dreams would be unavailable in the waking states, as well as the awareness of waking absent in the dreams, cross-references being confined to that of similar states. In those sections, however intriguing, the modern reader must suspend disbelief, occasionally embarrassed by the emergent gullibility displayed by the otherwise so incisive author. The empirical data refered to being beyond direct inspection and further analysis the material becomes invariably dated. James becomes only compellingly interesting again when he returns to his main subject, that of thought processes.

To James consciousness is what we now would call an epiphenomenon, an emerging feature, a case of the whole being more than the sum of its part. There is no such thing as an embryonic consciousness in every atom accumulating to our own. He takes the example of ten men in a row, each of them asked to pronounce a certain word. To each individual his task is meaningless, only to the one who listens to all the words in proper order does the sense emerge of a sentence. To James words themselves normally carry no independant semantic meaning, it is the relations between them that is important. He likens the whole thing to algebraic manipulations, where the symbols carry no specific numerical values, only at the end of a lengthy simplification, are actual values inserted resulting into a numerical result[4]. In the same way, only after a conclusion of a thought are words associated with meaning and as a result there will be a final infusion of sense. To James consciousness has evolved as a means of survival, as the nervous systems of the hemi-spheres have become far too complicated and unstable. Consciousness is there to make decisions, left to itself the nervous system would run amok. It is noteworthy how deeply James has digested the Darwinian paradigm, which at the time was highly controversial.

What is thinking. James poetically likens it to that of a bird alighting from branch to branch, alternatingly in flight and in rest. Thus a sequence of actions in the nature of solving problems, be they only in the nature of searching for a name, aimed at the temporary rest furnished by the relief of resolution. The flights are brief, James notes, too brief to be studied by introspection, and all what we remember are the results exhibited at the moments of rest[5]. Thoughts follow upon each other linked by association. Why a certain train of thought can usually be easily explained retroactively, it is far harder to predict its course. Still in ordinary discourse there is a high degree of expectancy being met, this is why we are able to interpolate, and why children can be spellbound by stories in which they do encounter many words they do not understand. This expectancy explains why we are startled by the introduction of a French word in an English text, or a colloquial expression in a formal discourse, even if we have not been following the sense. In fact

[4] This example gives a fair assessment of James mathematical sophistication

[5] On a more global scale, James remarks that we often can recall the contents of a book, without being able to recall any specific formulations

prose that is grammatical and conforms to our expectations appear filled with sense, even if there is none; while awkward sentences badly formed appear non-sensical although quite meaningful. As an example James takes the case of Hegel, whose wellformed sentences promise sense without delivering any, although many readers profess to find some[6].

Central to thought is the ability of distinction and likeness, to which the latter association is intimately connected. The first two may seem too basic for analysis, but James nevertheless has a few interesting things to say about them. First differences are only noted in entities that can be compared. You never ponder the difference between an elephant and the notion of ascerting the taste and color of coffee[7]. We make distinctions between similar entities when circumstances force us to do so, and this does not mean that distinctions were present before but that we were not consciously aware of them. To James the difference did never occur to us before and is as such something of a creation. James wonders whether we would ever be aware of the difference between cold and wet, would the two sensations always come together. In particular this means that it is impossible, or at least unfruitful, to try to analyze concepts into irreducible parts, further subdivisions are in principle always possible.

Crucial to the act of discrimination is the action of attention. The stream of consciousness is not just a passive stream following the gradient of least resistance, it is also directed by volition, as manifested by the state of attention. Being attentive means being selective, to phrase hypothesis, formulate expectancies, and to check outcomes. When we read a book we may remember very little afterwards, the reason being that the words of the book streamed through us as were we just passive vessels, we simply did not pay attention, we asked no questions, hence received no answers. As Darwin noted, there is no such thing as a disinterested observation, every observation is made on behalf of a theory, however rudimentary[8].

As often in his book James makes references, mostly German, to actual empirical measurements to illustrate and refine the cerebral theories he expounds on. Those measurements tend to be very voluminous, and are often very precise, obtained through awesome diligence and admirable ingenuity, and as such they are worthy predecessors of even more extensive efforts performed in the subsequent century; yet they seem to offer nothing new, in fact they appear almost irrelevant. Consequently the attitude of James is one of distracted duty. Somehow they should be important if psychology should make a serious claim for a scientific status, because what could be more objective than numbers, and what could lead us beyond mere introspection if not the ingenious manipulations of them? This strategy has proved wonders in the hard natural sciences like physics and chemistry, and

[6] Hard as it is to distinguish between objective meaning and non-sense, even harder it is to draw the line between subjective meaning and nonsense, hence James is prepared to give the matter the benefit of a doubt

[7] As specific examples from James evade me as I am writing those lines, I make up examples in the same spirit, incidentally testifying to the fact that the abstract may often be easier to remember than the concrete

[8] James notes that in the visual field there are small black spots normally unnoticed by most people. But when troubled by eye-problems, people tend to notice them, and are then hard to be convinced that they are not part of their present woes but have been present all along

would they not have potential in the theory of thought itself? But James is wary of such a mechanical attitude, in his concluding remarks summarizing his chapter on attention, he points out that many researchers in their quest for objectivity, reduces consciousness to nothing. It simply does not count, as it is not amendable to the objective approach, thus it is nil and should not be thought of at all. This attitude clearly dominated much of neurological science during the larger part of the 20th century, but James wants to have no truck with it. He simply refuses to comment on such a reckless attitude, which disregard the complications of feeling and effort introduced by Nature.

As to the introduction of quantitative methods in psychology James is very sceptical. In particular he dismisses the inflated claims of the German Fechner, who claimed to have found a fundamental law, named by him as Webers law, establishing a connection between the objective strength of a stimulation and the subjective perception of it as a sensation, namely that of a logarithmic one. If objective stimulations grow geometrically (as compound interest as James remarks) than the mind reads them of as arithmetic increases, a classical illustration being the classification of stars into magnitudes going back to the Old Greek[9] An obvious objection against such a claim rests on the fact that one cannot seriously relate objective measurements to subjective assessments. Still subjective experiences should not be discarded just because they cannot be measured, and ingenious experiments, involving people being tested at the limit of discrimination, seem to bear out Webers law, which basically says that there is no absolute measure of difference, it only makes sense when measured against what it is a difference from. But when careful calibrations are made, the neat connections as advocated by Weber, are not universally borne out, only within certain intervals. This was however noted by Fechner, claiming that Webers law still held, it effects just being obfuscated by other effects. James remarks sarcastically that in this way any claim can be made for a universal law to hold. In modern parlance again, this would be a natural stratagem to evade falsification. This is enough to make James condenscendingly extols the virtues of Fechner as a German scholar, only to so much the more effective dismiss him as a fool. Sound as James judgement may be as rejecting any claim on the kind of strict mathematical relationship you can expect in physics and chemistry to also hold in physiology[10], he seems to be missing the point in rejecting Webers law altogether. Ironically non-mathematicians tend to interpret mathematical thinking more literally than mathematicians. Having a long time ago been alerted to Webers law by my father I have over the years grown fond of it, as I have felt it to have been a precious paternal gift as most people I have encountered have not known of it and have become delighted when instructed. Webers law in its qualitative aspect says, as noted above, that changes are proportional to the strength of what it is a change of. We

[9] The Greeks classified stars into six classes, the first being the brightest ones, the sixth those barely visible to the (then necessarily naked) eye. It later turned out that the typical star of the first magnitude was about a hundred times brighter than a faint star of the sixth. Thus in modern astronomy, all celestial luminous objects are accorded a magnitude on a logarithmic scale each step corresponding to a factor of $10^{0.4} \sim 2.5$. In particular due to the precision of meausurements fractional magnitudes being discernable. In fact it turned out that the stars of the first magnitude actually spanned quite an interval, with Sirius measured at -1.6, thus as such ten times as bright as many stars also classified as stars of the first magnitude.

[10] Fechner refering to it as the basic Psychophysiological fact

may get incensed if we are made to overpay a restaurant bill with a few dollars, but could be very cavalier about reducing the price of our house as we sell it by tens of thousands of dollars. Given the circumstances, the first may be a relatively major difference, while the second, even if absolutely great, the relative difference is small. Unlike the case of money, when sensations are concerned there are no absolute units. Thus even if Webers law should not be taken too literally, it is instructive, and when it fails to hold, the reasons for it are interesting to pursue. In short in fashionable language, Webers law provides a kind of minor paradigm, with which to think of sensations. And in fact most kind of sensations are most instructively measured logaritmically, just as (biological) allometry in general is best displayed in that mode. In fact cruder versions of numerical law are invoked all the time, as in when remarking that the strength of a memory is proportional to the initial strength of the impression and inversely proportional to the distance in time, without implying a strict mathematical interpretation of the notion of proportional.

Rather than to attempt a systematic presentation of all the topics that James takes up in his volume, I would like to concentrate on the last two chapters, namely our conception of time, and intimately related to it, the notion of memory. First there is the relation between objectively measured time and the subjective perception of it. This can either be conceived locally, or more interestingly globally. Let us first concentrate on the local aspect. Our sense of time is continous, there are no perceived gaps, but a steady flow of consciousness. In a strict mathematical sense this is of course nonsense. We are not able to perceive an actual infinity of impressions or to form an equal amount of thoughts. From the modern point of view the amount of information we can receive and process by time unit is limited. James addresses the question by refering to actual measurements, as usual performed by diligent Germans. What is the shortest time interval we can perceive, or differently expressed, how separate in time must two events be in order not to be perecived as simultaneous[11]. Various figures are produced, some as remarkably short as 0.002 seconds. In general the time intervals depends on whether the sensations are audial or visual etc, and when various combinations thereof are measured a confusing arrays of figures are produced leaving us at a loss as to what they really signify. Now two time intervals below the threshold would thus not be perceived individually, but their totality would. The conclusion that some sub-concious recording is involved would lead to an infinite recess. Although James does not discuss this possibility explicitly, it is safe to conclude that he would reject it, just as he earlier rejected the possibility of subconscious discrimination of concepts. The illusion of the continuity of time nevertheless is no mystery, as any gap would be of too short a duration to be perceived. A very interesting aspect though, which was not available to James at the time, is the continous sensation produced by a movie, in which there is a rather limited number of frames per second, far fewer than our discrimination would allow. The general consensus seems to be that we make rapid interpolations, smoothing out the stream of images. I do not know of any experiments involving different number of frames shown to subjects, but I would be exceedingly surprised had not such

[11] This mirrors an earlier study mentioned by James, determining how far apart touchings on the skin need to be to be felt as different. It turns out that this actually depends on where on the body the experiments are performed. The resolution is very sharp on your finger tips, far less so on your back and thighs

experiments been conducted, and thus I conclude that the present standards in the movie-industry are more or less optional, and that an increased frequency of frames would not lead to a smoother sense of continuity[12].

How good are we at perceiving time? According to James we have only a direct perception of time for rather short intervals. How short? James is understandably a bit vague on the matter, mentioning stretches up to between a few seconds and a minute. For longer time intervals there is no direct perception, only a conception[13]. Thus a grown man is in no better situation to grasp the duration of thirty years than a child, although he has actually lived through the time span. Even timespans as short as a day or a week are nothing but abstractions. The historian acquires a better sense of the time of centuries through a greater intimacy of dates and events which gives structure to the spans, just as a geologist can appreciate the unfolding of millions of years, as they constitute the backdrop to events with which he is in the habit of making constant comparisons. The conclusion is, although James does not draw it, that our conception of long durations, are as limited as our field of vision. The more we try to cram into the latter, the smaller the details need to be, we simply do not have the option of enlarging our visual sphere. This leads to my favourite resolution of the universally acknowledged fact that as we grow older time seems to run faster[14] The sense of duration must be measured against something, and in our life the duration of our past is the obvious candidate against which change must be gauged. We are thus once again thrown into the kind of considerations that leads to the postulation of Webers law. Hence time is perceived logarithmically. In fact I have once made that explicit[15], 'tongue in cheek', but although I have no recollection of not having conceived of it myself, it would be naive to believe that the formulation would be original. In fact James does explicitly refer to a certain Paul Janet[16] who writes *There is a law by which the apparent length of an interval at a given epoch of a man's life is* proportional *[emphasis added] to the total length of life itself. A child of 10 feels a year as* $\frac{1}{10}$ *of his whole life - a man of 50 as* $\frac{1}{50}$*, the whole life meanwhile preserving a constant length.* James does, however, not give much for this, claiming that it hardly can be said to explain the mystery, and that a more prosaic explanation is that with increasing age the experiences become more monotonous, with fewer new ideas to introduce fundamental changes, and thus in retrospect they are compressed in memory. James is of course right in disclaiming

[12] Everyone is familiar with the jerky and quick movements of the early silent movies. I always thought that the reason for that was a lack of synchronization between the actual filming and the display; but I guess that the real reason must be that initially too few frames were taken, maybe simply because of the slowness of the film, and thus that a compromise had to be made between jerkiness and exaggarated speed of movements. Intimately connected with this, is the question of how many pixels we can perceive, and thus again the limit on how much information we can process.

[13] James mentions the ability to wake up on your own accord every morning at a precise time, but this is clearly a different kind of phenomenon.

[14] This ties in nicely with the perception of falling, as we approach the ground against we will be smashed, our speed increases. Thus this perception of doom, falling faster and faster into the void of death.

[15] 'Att mta och uppleva tiden' in 'Har du tid?' the year book of the Swedish Research Council 2000

[16] Revue Philosophique, vol.III p. 496

any strict numerical sense, yet his explanation seems to me to be not too different in kind from the one I have just proposed. The notion that life is too short, which we are bound to feel as it approaches its end, has no absolute meaning. Would we live for millions of years and then look back, I predict that the sensation of everything having gone by so quickly would still have been present. Our sense of time passed in our own life is almost as abstract as that of time endured in historical or geological contexts. But the momentary sense of time, as it is perceived moment by moment, is of course different. The seconds supposedly do not tick away quicker when we are old than when we are young, because this is a matter of time perceived and not conceived.

The fullness of a life is not to be measured in objective time, but with regard to the number of sensations and thoughts. Thus the author makes the thought experiment how life would be for an organism who would receive a thousand times as many sensations per second than a human. Such an organism would in the span of a few weeks experience as much as a human, and its life would feel as full. Would it live during summer, that would be conceived as the normal thing, and it would learn of winter and spring as we learn of events in history[17]. The sun would almost stand still in the sky, and the waxing and waning of the moon would almost be imperceptible. On the other hand an organism which would receive impressions a thousand times as slowly, would live for tens of thousands of years. A season would last for an hour or two, and the sun would only be discerned as a luminous streak in the sky[18]. Night and day would follow upon each other like the waves striking the shore, and thus be perceived as a continous pulsation of light and dark, not necessarily been considered in isolation from each other .

It has been noted that while most impressions on the brain are not true copies of outside events, but interpreted symbolically, as the lightwaves hitting the retina are processed by the brain into the sensation of luminosity; time is different, both the order of events and their durations being copied faithfully. James retorts that there is a subtle difference between sensation following each other sequentially, and the awareness of this sequence. Or by James own words *A succession of feelings, in and of itself, is not a feeling of succession*, the latter being a thought by itself. Once again a case of the psychologists fallacy.

Memories are in a sense our most valuable possessions, and without memory, no sense of continous connection of our identity. There is of course a strong distinction to be made between what we usually refers to as memory, namely what nowadays is refered to as episodic memory to stress thay they concern bits and pieces of our past conscious chronology, and memory of things which cannot be placed in a chronological setting, like that of names and facts. James does not bother to make this distinction clear, at least not in this chapter, but treats on almost equal footing the memories of names with that of episodes. As almost everyone must have noted, amnesia seems to be very selective. An individual supposedly forgets all his episodic memories, and thus finds himself at a total loss concerning his identity[19], while he retains his ability to use language unimpaired, as

[17] The reader may recall the passage in 'Tess of d'Urbervilles' when Hardy sadly recounts the short life of Tess baby, to whom weather must have been the same as climate

[18] Actually not quite. I trust the reader to make the obvious calculations

[19] but in particular he 'remembers' that he ought to have a past and finds his condition puzzling not

well as the ability to walk and eat and get around in whatever culture he has been bred. James does briefly touch upon this phenomenon, but almost exclusively in the context of hypnosis.

A memory, according to James, is a pathway in the brain. A pathway that has become more or less permanent by habit. To each memory there are paths of associations, and when we try to recall something, be it a name or an episode from the past, we activate the paths that appear to be close to the gap we so desperately want to fill. And just as in the case with children looking for hidden things, we are alerted as the trail gets hotter and hotter. Thus to James there is a very straightforward neurological basis for memory, but to the very experience of memory there remains of course still a wide chasm. The author postulates that to each memory, being in the nature of a thought preserved, there are paths to a winder context, allowing us to recognise a memory for what it is, a remainder out of our past. Without such a connection to a context, we would never realise the thought to have been of the past, and would be unable to distinguish it from the fabrications of mere fancy[20]

A good memory is a very desirable thing. The fewer our memories, and the more faded they are, the poorer our lives, at least as far as we think of memories as mental possessions. A man losing his memory, literally loses himself. As such memories come on par with outside sensations, if more intimate as being uniquely our own and literally non-communicable in their essence, because they are stored and need always to be retrieved by an agent - our conscious self. James claims that some people form memories more easily than others, their brains are like wax, and correspondingly impressible; while for others memory pathes do not form so spontaneously. He refers to this as desultory memory and speculates that people like Leibniz, Luther and Walter Scott must have had this purely physiological retentive capacity to a high degree, in view of their high productivity. Such people retain, seemingly as if by distraction, a wide miscellany of names, anecdotes, gossip, poetry or whatever come in their way. James is however doubtful whether this mechanical property of memory can indeed be exercised, just as we exercise our muscles to improve them. Because what makes us form and retrieve memories are the pathways that are formed. The more extensive and the more connections, the easier it is to remember and recall. Thus somebody like Darwin, who systemized all his knowledge into a theory, thereby connecting each fact with many others, was thus able to retain a huge amount of information. Not by rote learning, but simply because the facts formed patterns, and it was easy to go from one to another. Conversely one assumes that facts that were of no use to him were unsentimentally forgotten. Within each scholars eruditions there are entire encyclopedia of lacunae, writes James.

When it comes to memorizing there are essentially three methods James proposes. The mechanical, the judicious and the ingenious. The mechanical is by pure repetition. Recalling a fact over and over again in order to form strong pathways of habits. He

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to say traumatic

[20] James refers very briefly to the well-known phenomena nowadays known as a *deja vue*. One explanation refered to concerns a stipulated timelapse between the nerve impulses reaching the two hemispheres, while James explains it as a temporary impairment in the feeling of 'pastness' each memory is imbedded into. An 'explanation' leaving something to be desired

does in fact refer to a few studies, some of which he performed on himself and induced others to submit to, in which the effectiveness of memorization of both nonsense syllables and lines of poetry have been considered. It would be pointless as usual to refer to the exact figures, no doubt such studies have in the interrim been repetaed *ad nauseum*, but one conclusion is worthy of repeating. Forgetting seems most rapid in the beginning later to slow down. Thus typically half of the lines of poetry learned one day may have gone the next, although recovering is faster than initial learning. Incidentally learning by heart was far more common in the past than now, its pedagogical value nowadays being considered highly questionable[21]. Furthermore the social value of knowing poetry by heart has similarly, for better or for worse, drastically declined in the past century.

The judicious memorization is by learning things the proper way, i.e. in a context. As noted above, a well defined system of thought, highly connected and structured, fixes facts firmly. Thus James admonishes the student from *cramming* (the very word being used) the night before an exam. What is mechanically acquired will quickly be forgotten when there is no more use for it. Thus when it has served its ostensible purpose, the passing of an exam, it will be gone. But the student, who does not study merely to be tested, but to integrate the material during an extended time, creates in the process the structures into which it should fit, and also gives time to consistently repeat and recall, and thus fixing everything firmer in the mind. Incidentally, James remarks that even when engaged in mechanical memorization, it is better to make the efforts of recalling, than to repeatedly refering to the text to be learned, as the additional effort grinds the grooves deeper. All of this is of course in the nature of common pedagogical knowledge, repeated to generations of students.

The ingenious method is by trickery. Establishing links with what is already formed and ready, old pathways can be exploited. One particular example being associating to each digit a few consonants, then by filling out by vowels encoding random numbers into familiar words[22]. With such trickeries astounding feats can be performed with some practice, in essence not different from those practiced by magicians.

As observed above, James does not believe that the physiological aspects of retention can be improved (Except they are of course dependent on your condition. When drunk, tired or sick your capacity is below par). And he explains the many exemplary anecdotes to the contrary to be illusory. In particular the politician who improved his memory by the end of every day recalling to himself (and later to his wife) 'everything' that had occured to him during the day, and noting over the decades a striking improvement from his youth; did not so much improve his retentive powers as perfecting his strategy of paying more attention to the events of the day with a view of recalling them in the evening.

But remembering is not everything, forgetting is also a crucial part of recalling. Would we never forget anything, we would get lost in the mess of irrelevant details. The task

[21] I recall my paternal grandfathers autobiographical notes, in which he refers to his intention to learn a certain historical textbook by heart, thereby embarrassingly confusing depth of knowledge by faithfulness of the same

[22] Such mnemonic tricks are of course well known to the modern reader. I still recall from almost forty years ago the 'Oh be a fine girl kiss me right now sweetie' whose initial letters spell out the spectral classes of stars. Whether I still retain the order properly needs to be checked

of retrieving anything from your past would be interminable, as the chain of associations would be stretched out by inconsequential distractions[23]. In fact most of the things that pass through our consciousness are discarded, after having served a short sentence of use. The idea that everything we remember has left a trace and thus in principle retrievable from memory (e.g. through hypnosis) is a nice idea but one which James sees no sound reason to believe in, although he allows anyone foolish enough to be persuaded by any specious arguments to be welcome to draw comfort from it. On the other hand he does refer to a few cases when long-forgotten memories have surfaced in individuals to which they must have been nonsense[24]

In conclusion James is an observer, critically assessing his introspection. He has little patience for exact laws or elabourate theories, whom he finds artificial and consider a burden and a hindrance, rather than a help, to the science of psychology.

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[23] In one of Borges stories, a man is cursed with a perfect recall, having in the terminology of James an almost unlimited desultory memory. This is a case of pure fiction, but a real life approximation has been repeatedly refered to in the literature, as a patient of the Russian neurologist Luria

[24] In particular a story of an uneducated girl who in a delirium recited sentences in Hebrew, each of them consistent, but with no relations to each other. The explanation being that she had in her childhood been living with a minister who had habitually recited from the Bible in Hebrew.