

Notes on Funes

It doesn't seem untrustworthy to me the capacity of Ireneo Funes to store remembrances having been portentous, unheard-of. After all, our brain is made up by units, nervous cells in not less big a number. In fact, it is said that we reach in the teens (perhaps around the age when Ireneo had his enlightenment), some hundred thousand million neurons (a 1 followed by eleven 0's), each of them working as a processor, an independent computing machine.

Tells Borges that, appalled by the multiplicity of his remembrances, Funes "decided to reduce each of his past days into some seventy thousand remembrances, which he would define then by numbers. Two considerations dissuaded him: the awareness that the task was endless, the awareness that it was useless". The second epithet has, it seems to me, something of subjective. The first one, on the other hand, could have been matter of verification. The point is: how long takes (or took to Ireneo) the evocation of one of those seventy thousand remembrances which, I understand, are composed not only by images but also by stimuli to the other senses. For this we haven't got any information that could help us to give an answer.

In any case, what I wonder is not whether was the task terminable, but whether was it possible, even relying on infinite time. Is it logically possible an infinite memory on a finite physical support? My first intuition is that it isn't, but immediately I notice that, precisely by virtue of the almost unbounded number of units of computation and representation composing our brain, Ireneo wouldn't have need an unlimited memory in order this task to be achievable, even at risk of spending his life without being able to accomplish it. I explain myself: assume by now that each remembrance of Ireneo was representable by a visual image. Let us consider a very high resolution photographic image, say 256×256 , and in a 256 colour scale¹. In a binary representation, this would make 2 to the 16th power positions, each one representable by 2 to the 8th power positions. This amounts to a total of 24 binary units to store each remembrance. On the other hand, 70,000 is less than 2 to the 17th (about 130,000). Therefore, the 70,000 one-day remembrances would have required $24 + 17 = 41$ binary units to be represented. I am making two assumptions, both quite disadvantageous for my estimation:

- 1) Each neuron can be only in two states, 1 or 0, active or inactive, on or off if

¹ A pretty rich palette. Has any human, even a professional painter, such a capacity of chromatic discrimination? (Note for the English version).

preferred.

2) Ireneo's images were independent between each other and completely non redundant in themselves. This is untrue, in general. Even so, we notice that in order to store all the memory of his life in the way how he planned, Ireneo, who was nineteen (less than 2 to the 5^{th}) years (365 , less than 2 to the 9^{th} days) would have had far enough with the capacity of representation of $41 + 5 + 9 = 55$ binary neurons. This means that he was able, given time enough (or the adequate velocity of evocation), to accomplish his project engaging far less that a thousand millionth part of his memory capacity. As for the other senses, it is clear that not every image we remember comes necessarily along with auditory, olfactory, tactile or gustatory stimuli (I would say these are rather few) but, even if that should be the case and we had to multiply by five the volume of information, things would not be quite different.

Concerning the problem of the time that the task would have demanded, and considering that, as suggested by the witness, Ireneo hardly slept at all, we can remark that the day lasts $60 \times 60 \times 24 = 86,400$ seconds. Funes counted on a little bit more than a second for retrieving, fixing and numbering each remembrance. Would it have been enough? We don't know.

Of course, here we also assume that, in the future, Funes should have resigned every new sensorial experience and even every new feeling or reflection, or reduced them to a minimum. This, given his state of prostration, would have been perhaps not difficult for him, moreover if we accept the personal Borges's impression, in the sense that Funes "was not quite able to think".