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Ramon y Cajal, a pioneer in science fiction

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In 2002, we will commemorate the 150th anniversary of the birth of Santiago Ramón y Cajal (1852–1934). Different events will be organized on this occasion, bringing the opportunity to evoke a man who, besides his recognized contribution to the development of neurobiology, is the most outstanding Spanish scientist. A brilliant researcher (he was awarded, along with Camillo Golgi, the Nobel Prize for Physiology or Medicine in 1905), gifted and ingenious, he was able to communicate his enthusiasm to his disciples, creating a school well known around the world. Besides being a scientist and a university professor, Ramón y Cajal was a Renaissance man, fond of arts, mainly painting (his famous drawings of cells are beautiful and highly accurate), photography and writing, which he also practiced by producing several novels and short stories.

Vacation stories (Fig. 1), the English translation by Laura Otis [10] of *Cuentos de vacaciones* (the sixth edition published in Spanish by Espasa appeared in 1999; and a special edition by Libros Clan appeared in 1995) reveal Ramón y Cajal's aptitude for science fiction. Laura Otis' translation is a most clear evidence of the validity and interest in the fiction work of Ramón y Cajal. With a dual background in neurosciences and comparative literature, Otis became fascinated by Ramón y Cajal's talents and started studying his work and personality. As a result, she translated *Vacation stories* into English, and this was published by the University of Illinois Press in 2001.

Best known for his studies of neurohistology, Santiago Ramón y Cajal also used his visual imagination to create some ingenious science fiction. In 1885–1886 he wrote 12 “narracionesseudocientíficas” about the ethi-

cal and technological issues he was encountering in the laboratory. In his first story, a jealous bacteriologist who suspects his wife is deceiving him with his laboratory assistant infects them both with tuberculosis and then publishes the results of his “experiment.” Almost 20 years later, in 1905, Ramón y Cajal published five of these stories in a volume entitled *Cuentos de vacaciones* [7], identifying its author only as “Dr. Bacteria”.

Literature was always an important part of Ramón y Cajal's life. In Madrid, he went regularly to the “ferias del libro”, and he owned more than 10,000 volumes on the humanities [2]. The *Cuentos de vacaciones* were by no means the only fiction he wrote. According to French philosopher Henri Bergson, Ramón y Cajal first “saw” the truth and then confirmed it experimentally [3]. Ramón y Cajal never trusted an idea that could not be represented visually, and he thought that words lost their meaning once they were cut off from visual images. The problem of seeing is as essential to art as it is to science, and Ramón y Cajal's creative writing, like his scientific drawing, calls attention to the many aspects of vision.

As a boy, Ramón y Cajal had longed to be an artist, and, as a scientist, he continued to believe that drawing taught people to observe the world more closely. In *Reglas y consejos sobre investigación científica: los tónicos de la voluntad* [5], he cited comparative anatomist, Georges Cuvier, who had claimed that, without the art of design, natural history and anatomy would have been impossible. According to Cuvier, people needed to understand their own artistic conventions and ways of representing the world before they could start comparing the forms of animals. To see reality as it was, they needed to know what seeing meant.

In the 1880s, when Ramón y Cajal established himself as a scientist, most microscopists were concerned about microbes. Within 10 years, Robert Koch had identified the microorganisms that caused anthrax (1876), tuberculosis (1882) and cholera (1884), and Louis Pasteur (who had preceded Koch in attributing diseases to

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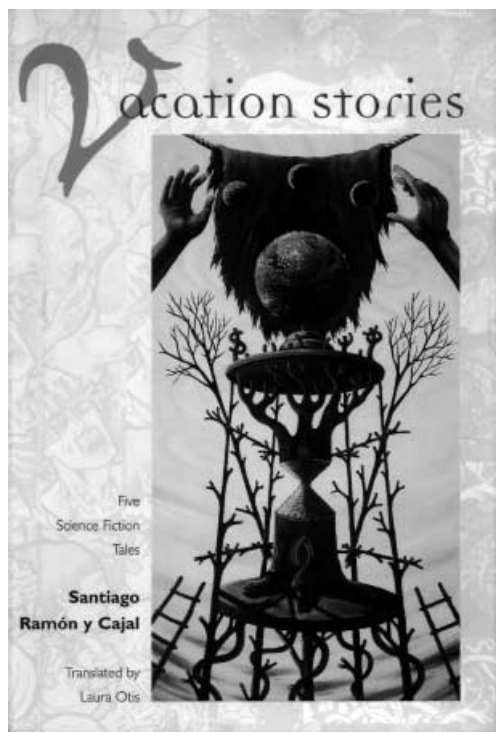


Fig. 1 Cover of *Vacation stories*. Five science fiction tales, the translation of *Cuentos de vacaciones. Narraciones pseudocientíficas*, by Santiago Ramón y Cajal. Translated by Laura Otis. 2001. University of Illinois Press, Champaign, Ill., USA. 246 pp. 23.5×15.5 cm. ISBN 0-252-02655-1

microbes) had developed vaccines for anthrax (1881) and rabies (1885). Considering how quickly infectious diseases were being attributed to micro-organisms, it seemed likely that someday all of them might be explained as a result of microscopic studies. In Ramón y Cajal's fourth story, the protagonist refers to the "still unknown germs of cancer".

It was one thing to identify a causative micro-organism, though, and quite another to develop a cure. To some degree, knowing that germs caused diseases made life much more frightening, since, although bacteria could be visualized under the microscope, there were few ways to fight them once they had infected the body. During 1885–1886, while Ramón y Cajal was writing the *Cuentos de vacaciones*, a cholera epidemic broke out in Valencia, where he was working. Physician Jaime Ferrán had developed a vaccine to the cholera bacillus identified by Koch; and, in 1885, Ramón y Cajal joined other Spanish microscopists in testing Ferrán's serum [11]. He focused his attention on the nervous system only after the cholera epidemic had waned in 1887.

Ramón y Cajal's early fiction reflects his fascination with microbes and the body's ways of fighting them. While studying for his bachelor's degree, he created an adventure novel patterned after Daniel DeFoe's *Robinson Crusoe*. Later, in medical school, he wrote a second one about an explorer who traveled to Jupiter and ended up

inside the body of a gigantic being. This biological novel, as Ramón y Cajal called it, showed readers the body from a microbe's perspective and featured terrible battles between white blood cells and invasive parasites. Both were richly illustrated, but sadly, both have been lost. Ramón y Cajal believes that the second one disappeared while he was serving in the army in Cuba.

As literature, the *Cuentos de vacaciones* have more in common with these early adventure novels than with his epigrammatic later works. His autobiography, *Recuerdos de mi vida* [6] – like *Reglas y consejos*, designed to inspire future scientists – appeared in 1901 and sold quite well. Two other works, *Charlas de café* [8] and *El mundo visto a los ochenta años* [9] offer astute observations and witty advice about how to survive in society. They reflect his many years of participation in "tertulias", where he exchanged ideas with intellectuals from all fields.

As a fiction writer, Ramón y Cajal owes the most to Jules Verne, whose best loved novels had appeared shortly before he developed his passionate interest in medicine. With his vivid descriptions, Verne took his readers to unknown worlds, and it is easy to see why his intensely visual style would have appealed to the artistic medical student. Ramón y Cajal mentions *Five Weeks in a Balloon* (1863), *From the Earth to the Moon* (1869) and *Around the World in Eighty Days* (1873) as sources of inspiration. To complement Verne's novels of exploration, Ramón y Cajal believed, the French writer needed an adventure about the body, and finally he wrote one himself.

While consciously trying to imitate Verne's science fiction, Ramón y Cajal also recreated some of the classics of Spanish literature. In his first story, he uses the title – and, to some degree, the plot – of Pedro Calderón de la Barca's play, *A secreto agravio, secreta venganza* (1636). In this play, a man suspects his wife of adultery, and, rather than confronting her and her potential lover, he concocts a covert scheme to dishonor him. Ramón y Cajal's version of *A secreto agravio* owes even more to another of Calderón's plays, *El médico de su honra* (1635), in which a man has his innocent wife bled to death because he suspects her of being unfaithful.

Ramón y Cajal openly acknowledged his debt to Miguel de Cervantes, and his second story, *El fabricante de honradez*, recalls one of Cervantes' "entremeses". In this play, *El retablo de las maravillas*, two tricksters set up a table in a small country town, telling the inhabitants that miracles take place upon it, but only Christians of legitimate birth can see them. Naturally, no one admits that he cannot see the elusive miracles. One can understand why the play would have appealed to Ramón y Cajal, who fought social suggestions that altered people's vision of reality.

Besides drawing on Verne and classical Spanish writers, Ramón y Cajal owes a great deal to his contemporaries, the generation of 1898: Azorín, Pío Baroja and Miguel de Unamuno [1]. Although Ramón y Cajal

wrote the *Cuentos de vacaciones* in 1885–1886, he edited them extensively in 1905, so that they can be associated with this literary movement. Like Ramón y Cajal, its writers focused on individual will-power as a means of regenerating the country. Alarmed by Spain's loss of its last colonies to the United States in 1898, they lamented their country's slow cultural decay since the mid-seventeenth century and called for political and educational reform. As can be seen in the *Cuentos de vacaciones*, particularly the last one in which a grown-up test-tube baby deplores his useless education, Ramón y Cajal supported their views that Spaniards needed to study other European cultures. At the same time, he agreed with these writers that Spaniards had to look inward and learn what made their own country unique.

Whatever Ramón y Cajal may owe to other creative writers or scientists, his vision is still his own. Like all science and fiction, his *Cuentos de vacaciones* allow readers to see things in a new way, inviting them into a world where microbes threaten, but the scientists studying them may be more dangerous still. The loss of his two early novels and seven of the 12 stories is a great tragedy, not just for literature, but for science. If Ramón y Cajal was right, new ways of seeing meant new ideas, and he offered these in his fiction as well as in his scientific writing.

Ramón y Cajal may well have suppressed the remaining seven stories for political reasons. Known as a liberal, he contributed many articles to the journals *El liberal* and *El imparcial*. A progressive thinker, he regarded himself as a worker and criticized aristocrats who lived parasitically off the memory of their ancestors [4]. When he moved to Madrid in 1892, he chose the working-class neighborhood of Cuatro Caminos, because it was the place where he felt most comfortable living. As a scientist, he was never highly paid, and he – and his six children – could probably not have afforded to live anywhere else. Ramón y Cajal was infuriated by references to Spanish workers' laziness, attributing their low achievements to poverty and ignorance. Having risen from poverty himself, he confessed that “sin querer columbro siempre, a través de cada moneda recibida, la faz curtida y sudorosa del campesino, quien, en definitiva, sufraga nuestros lujos académicos y científicos” [2].

While statements like this might have disturbed officials enough to cut off his funding, Ramón y Cajal's left-wing views were combined with beliefs that are hard to reconcile with liberalism today. Intensely patriotic, he considered love of country one of the most essential qualities for a scientist. Ramón y Cajal's devotion to Spain, moreover, did not stop at the Atlantic and Mediterranean coasts. A dedicated imperialist, he saw science as the key to recovering Spain's lost empire. Like many bacteriologists of his day, he believed that scientists should form a colonial vanguard, attacking the microbes that prevented Europeans from settling in Africa. While such ideas would arouse intense opposition today, they were common at the time. Arthur

Conan Doyle, another fiction writer trained as a physician, ran for parliament as a Liberal Imperialist.

The views on race and gender expressed in the *Cuentos de vacaciones* are today even more disturbing. The protagonist's long anti-Semitic harangue in *El hombre natural y el hombre artificial* attacks Jews for their lack of patriotism, and many other remarks – sometimes presented by narrators as accepted truths – link general attitudes to particular peoples. An author's view can never be identified with his character's, and I have found no other anti-Semitic passages in any of Ramón y Cajal's writing. There are numerous generalizations about race, but one must keep in mind that in 1905, race science was a scientifically respected field, an accepted division of anthropology. Among its practitioners were Jewish anthropologists who sought to define their “race” and culture in relation to those of other peoples. When Ramón y Cajal's character refers to the Jews' inherent materialism, he is echoing the views of respected authorities.

Ramón y Cajal's negative depictions of women are also typical for his day. The *Cuentos de vacaciones* present women as vain, undisciplined, capricious and dangerous because of their vulnerability to suggestion. As a whole, the stories are thoroughly misogynistic, reinforcing Ramón y Cajal's comment in *Reglas y consejos* that a woman is a necessary evil, a backpack that weighs you down in battle but comes in handy once the fighting is done. In the stories, particularly *A secreto agravio*, *secretos venganzas* and *La casa maldita*, women are depicted favorably only when they yield to men's superior reason and will.

Judging past writers by present standards has never been a fruitful task. It is important to note that sexism and racism extended to gifted scientists in 1905 and were not restricted to marginal groups, but it is pointless to attack a writer 100 years after the fact for voicing views generally accepted in his culture. Instead, we can celebrate Ramón y Cajal's unique vision, his image of the brain as a dynamic system full of endless possibilities. Ramón y Cajal's pictures of independent neurons have inspired generations of scientists to sculpt their own brains. Hopefully, his stories do the same for all readers.

References

1. Granjel LS (1960) Baroja y otras figuras del noventiocho. Guadarrama, Madrid
2. Lewy Rodríguez E (1985) El Madrid de Cajal. Artes Gráficas Municipales, Madrid
3. Marañón G (1950) Cajal: Su tiempo y el nuestro. Zúñiga, Santander
4. Perrín TG (1958) Cajal como español. *Abside* 22:191–216
5. Ramón y Cajal S (1898) Reglas y consejos sobre investigación científica: los tónicos de la voluntad (15th edn, 1999). Espasa Calpe, Madrid
6. Ramón y Cajal S (1901) Recuerdos de mi vida (4th edn, 1984). Alianza Editorial, Madrid
7. Ramón y Cajal S (1905) Cuentos de vacaciones. Narraciones seudocientíficas (15th edn, 1999). Espasa Calpe, Madrid

8. Ramón y Cajal S (1921) *Charlas de café (pensamientos, anécdotas y confidencias*; 3rd edn, 1923). Espasa Calpe, Madrid
9. Ramón y Cajal S (1934) *El mundo visto a los ochenta años*. Espasa Calpe, Madrid
10. Ramón y Cajal S (2001) *Vacation stories. Five science fiction tales* (translated by Laura Otis). University of Illinois Press, Champaign
11. Ramón y Cajal Junquera S (2000) Ramón y Cajal, microbiólogo. *Int Microbiol* 3:59–61