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Alumnus interview: Ger Post

A different angle on Science
By Iris Proff

Ger graduated from MBCS in 2011. Today, he works as science journalist and teaches at university. We met in his office in buzzing Leidsestraat. The house is a shared workspace of 28 independent journalists, artists and script writers, with hipster concrete floors, a hammock and a wooden kitchen counter - the perfect place to get inspired, it seems.

How did you get involved with science journalism?

I did a bachelor's in journalism and then started to do psychology, so I was constantly writing articles for newspapers and magazines while I was studying. Only gradually I shifted towards science journalism. In the beginning, I could write some interviews with neuroscientists for the magazines I was already in touch with. Then I published a popular science book on performing under stress and that made it a lot easier. Suddenly they chased me to write for them!

Was it hard to decide against the common path after you graduated and not to do a PhD?

No, not so much. I did my first internship on deep brain stimulation in rats at the NIN. I remember sitting in a dark room writing articles while the rats were being trained and checking every now and then if they are still going. Already at that time I realized that I didn't like the lab work that much. I liked writing about science more than doing it myself. But after some years away from academia I started to miss reading journal articles and the scientific thinking. Then I got a job at university for 20 hours a week and the other half I spend writing. That works really well for me. Working at university is inspiring, I get a lot of ideas for new articles and it helps to have a stable income.

What are the biggest challenges you face every day as a freelance journalist?

Getting up in the morning and telling myself that it's really important that I write an article. Apart from that, not having colleagues is sometimes difficult. That's also why I'm working in a shared office. Also, there is this very thin line between having too much and not having enough work.

What is your mission when you write a science article?

Hm, good question. I try to give an insight into what researchers have actually done in their experiment and how they reach their conclusion. Then it's up to the reader whether they agree with the line of reasoning. I try not to just aim at the results. Of course, that doesn't mean writing up a whole methods section (laughs), but science journalism should not brag about the impact of a study on society. Some years ago, I read an article in a newspaper titled "stress causes artery disease" with a picture of a person working at a laptop. But the original study was an experiment on mice which were tortured for six days. That's quite different from me sitting at my work and

experiencing time pressure. You can still talk about the implications of the experiment, but you have to put them in perspective. I really think that people are not stupid. But of course, it does not grab the attention as much as a catchy headline.

Do the skills you acquired in our master's help you in your work today?

I think so. When I was studying psychology, I had this image that neuroscience would solve all matters. I thought if you just look in the brain you see what is really happening.

Oh well, if it was that easy!

Exactly, that's what I found out in the master's. I was doing a project on schizophrenic mice. And I thought... are these mice really schizophrenic? (laughs) What does it even mean? I understood how many debatable points research has. If you make a different choice at some point of your study it affects the whole outcome. It made me very critical and cured me from my hyped view on neuroscience.

Do you think it makes sense to get a PhD to become a science journalist?

Yes, I think so. Doing a PhD you learn working in a very systematic way. That can help you as a journalist as well. On the other hand, in a PhD you are often not trained to explain your topic to people outside your field of expertise. You are trained to contribute to science, and to explain your research to peers. But I like to think that writing articles or popular science books you can contribute something as well.

Ger currently works for our Brain and Cognitive science masters and is coördinator of the firstyear course STICS. Thanks a lot for the insightful interview, Ger!



Do plants have thoughts?

By Mariana Duque Quintero

Ever since neuroscientists have worked towards a unified view of the mind and the body, understanding behavior has both required studying the mind and the brain. In this context, the idea of plants expressing behavior feels conflicting... does accepting this idea mean that plants should have minds? If that is the case, what operates the mind if plants are brainless?

One way to go when facing these questions is to say there is no behavior without a nervous system, putting down the discussion. An alternative and bolder path was taken by Darwin in 1880, when he proposed that plants do have a command center. In his book entitled *The Power of Movements in Plants*, Darwin proposed that the root apex is a brain-like structure, endowed with high sensitivity to guide navigation through the soil (1). Those who followed up on this idea have been judged for basing their field of "plant neurobiology" on superficial analogies that scale from synapses to plant intelligence (2).

A non-brain-centric approach is to seek for an understanding of behavior that includes organisms without neurons. Defining behavior by stimulus-responses has opened up this possibility. Just think about a Venus flytrap closing its leaves to take on a crawling prey, or a seed breaking its dormancy when there is a forest clearing. You could say these behaviors parallel reflexes in animals, keeping in mind plant's different timescale for action. In both cases, behavior is hard-wired to allow plants and animals an efficient response to the pressing conditions of the environment. However, it is inaccurate to describe every plant behavior as inflexible. Plants are amazingly plastic, partly due to their lifetime capacities for growth of the shoot, roots and peripheral organs.



As a result, plants are inherently capable of altering their phenotype when needed, giving them a good degree of behavioral flexibility. The South American vine *Boquila trifoliolata* can mimic the size, shape, color and orientation of the leaves of its supporting tree. This seems to help reduce herbivory as the vine can hide in between the leaves of its host, dividing predation for the two. What triggers the physical change? It is thought that the vine can take volatile organic signals coming from the tree it mimics (3). This is a good example of how morphological change and also plant communication allow plant's flexible responses.

Either fixed or not, describing behavior in terms of stimulus-response fits well for plants, as well as it has fitted other nonhuman organisms. This is the behaviorist solution: looking only into the present circumstance as the determinant of action (4). Is there a possibility to push the limits farther from the present regarding plant behavior? Can plants anticipate upcoming stimuli and choose for a response?

Anticipating the future requires an organism to dissociate from the immediate surroundings and act guided by acquired knowledge: a type of processing that needs memory. Some consider that growth gives plants a degree of the storage capabilities that memory gives to animals. According to this view, the history of a plant is saved as it grows, located in a distributed manner throughout its modular body. However, having this ontological data does not imply that a plant is capable of accessing it to inform choice (5). Arguments in favor of attributing plants the kind of behaviors that demand some level of information processing seem to be weak. Metaphors referring to animal behavior have taken some researchers to suggest not only that plants can memorize, but also play, sleep, solve problems and do cognition. In my opinion, this seems to surge from human's strong tendency to explain other beings from the dimension of our own species. The sad risk of this view is that we may be missing out on the chance to appreciate the singularities of other forms of life that count on different means to successfully co-exist with us, even without a brain.

This text was inspired by a Tuesday drink's unplanned philosophy session. Thanks Lewis! ©

1. Baluška F, Mancuso S, Volkmann D, Barlow PW. The 'root-brain' hypothesis of Charles and Francis Darwin. *Plant Signal Behav.* diciembre de 2009;4(12):1121-7.
2. Alpi A, Amrhein N, Bertl A, Blatt MR, Blumwald E, Cervone F, et al. Plant neurobiology: no brain, no gain? *Trends Plant Sci.* abril de 2007;12(4):135-6.
3. Gianoli E, Carrasco-Urra F. Leaf mimicry in a climbing plant protects against herbivory. *Curr Biol CB.* 5 de mayo de 2014;24(9):984-7.
4. Seligman MEP, Railton P, Baumeister RF, Sripada C. Navigating Into the Future or Driven by the Past. *Perspect Psychol Sci.* 1 de marzo de 2013;8(2):119-41.
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The answer to your biggest question: What were the answers to last month's

crossword?

Across

1. Wernicke's
7. Striatum
9. Substantia Nigra
11. Cerebellum
12. Insula
13. Hippocampus

Down

2. Somatosensory
3. Brainstem
4. Visual
5. OFA
6. Amydala
8. Thalamus
10. STN

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Science corner: Phineas Gage is - mainly- a myth

By Linda Jolink

According to my memories, not a single neuroscientific class went by without at least one mentioning of Phineas Gage, the legendary patient whose entire personality changed after he got a stick through his prefrontal cortex. However, in the March the Dutch journal for psychologists (*De Psycholoog*) published an interesting article called "Phineas Gage is not who he seems to be" (1). If you're one of those people who enjoys outsmarting professors (ahem), this article will delight you.

The story as we know it

In my experience, Phineas Gage is usually presented during lectures as a capable, decisive man who supervised the making of a new train rail. During the activities, he unfortunately stamped an explosive with a big stick, upon which the stick got rammed through his left eye socket and ruined his left prefrontal cortex. As by a miracle he recovered from this enormous wound, but his personality had drastically changed. After the incident he became grumpy and impulsive. He cursed a lot and was not capable of planning anymore, so that he had to quit his executive job. This case history illustrates the significance of the prefrontal cortex for personality and executive functions.

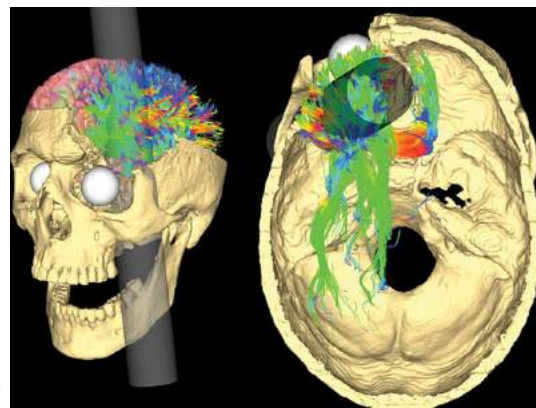
The facts

Malcolm Macmillan decided to write a 576 page book about how little we know about Phineas Gage (2). All interpretations of Gage's case (which usually contain a remarkable amount of adjectives and superlatives) are ultimately based on the notes of his doctor, John Martin Harlow. These were published in the year of the accident (1848). Harlow's most salient remark in this short report states that the balance between his intellectual capabilities and his animal tendencies seems to be destroyed (1; translated by me from the Dutch article as I do not have access to the original notes). Moreover, dr. Henry Bigelow examined Gage and made him undergo several neurological tests in 1849. He wrote that Gage seemed "quite recovered" in terms of somatic and mental

functions. Lastly, dr. Harlow wrote a post mortem report eight years (1868) after Gage's death in 1860. This was mainly based on the stories of Gage's family members. Bottom line: Gage migrated to Chile a few years after the accident and worked there as a coachman for seven years, guiding coaches over mountain ridges. A Chilean physician wrote about Gage in the period: "In the enjoyment of good health with no impairment whatever of his mental faculties." Harlow writes about the older Gage that he handled children and animals lovingly.

The myths

In Harlow's and Bigelow's reports, as well as in other writings of Gage's contemporaries, little to nothing is mentioned about violent behavior, a lack of responsibility or a sinful life style, let alone more specific interpretations like the fact that he cursed, gambled or stole a lot. These all seem to be (quite wild) interpretations of Harlow's note about a destroyed balance between Gage's intellectual capabilities and animal tendencies right after the accident. The root of the evil
The source of all this nonsense seems to be *Descartes' Error* (3) by Antonio Damasio (to my grief, actually, because it is one of my favorite neuroscientific books – I still recommend it!). As a neurologist, Damasio worked with patients with prefrontal damage himself, and he saw their risky behavior and societal disfunctioning in his daily practice. This has probably led to his colorful interpretation and description of Gage's case as a drunk, loud and lying man. Subsequently, the story from Damasio's popular book has been adopted and further interpreted by many others.



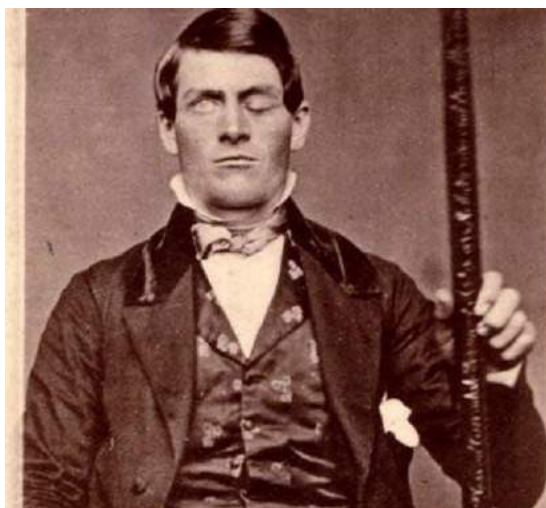
For example by Dick Swaab, who invented, *inter alia*, that "half a teacup of brain tissue leaked on the ground" and that Gage often fought after his accident (4).

Conclusion

There is much evidence that the prefrontal cortex is involved in executive functions and personality. However, the case of Phineas Gage is a bad illustration of this fact. First-hand documentation about Gage is scarce and is usually highly over-interpreted in recent literature (both the dramatic personality change after the accident and his high capabilities before the accident). Judging from first-hand evidence, Gage's case may as well be an illustration of the great plasticity and adaptive powers of the human cortex.

References

- (1) Read the entire (Dutch) article here: http://www.haraldmerckelbach.nl/artikelen_nederlands/2018/Phineas%20Gage%20Is%20Niet%20Wie.pdf
 - (2) Macmillan, M. (2000). *An Odd Kind of Fame*. Cambridge: MIT Press.
 - (3) Damasio, A. (1994). *Descartes' Error*. USA: Putnam Publishing.
 - (4) Swaab, D. (2010). *Wij Zijn Ons Brein*, p. 287. Amsterdam: Atlas Contact.
- Upper mage courtesy Van Horn JD, Irimia A, Torgerson CM, Chambers MC, Kikinis R, et al.*



COMIC

By Linda Jolink



Fill in the blanks: A gruesome morning

By Linda Jolink

It's a beautiful Wednesday morning and your (your favorite macroanatomical brain structure) is firing like never before as you walk through (notorious street in Amsterdam). But lo and behold! Some 100 meters before you, you see (your MBCS nemesis), walking hand in hand with (most boring professor you ever had). They seem to be discussing some evil plan for (cooking technique) every single (fluffiest mammal you can think of) in (body liquid). You, being a former member of (club you joined as a child) cannot let this happen of course. You hide behind a (bad spot to hide), put on your most (archaic adjective) smile and your (superlative) hat (which your normally only wear on (90s pop star)'s birthday), and you walk right towards the vile duo. " (smooth way of greeting), (MBCS nemesis)!", you say to the (way of looking) face of your archrival, who turns (color) upon hearing your (adjective describing sound) office. " (your favorite movie catchphrase)", you add. (MBCS nemesis) and (boring professor) immediately understand that they're in serious trouble and try to (way of moving) away, but you jump into your (vehicle) and race right after them. You chase the maniacs all the way to (bus stop at Science Park), where (your hungriest friend) is hanging around because (your favorite study association) is handing out free (patriotic pastry from your home country). After you've convinced (hungry friend) that preventing two lunatics from world domination is at the moment more important than cake, you both hurry towards the roof of Science Park 204, where you hold a megaphone right next to (hungry friend)'s (body part). It makes a sound so excruciatingly (adjective that describes your favorite candy bar) that it makes everyone's pants (adjective that describes your first kiss). The campus explodes in (sound) as everyone looks at the two lunatics, who now lie exhausted on the ground. After a quick investigation, you find out that the sound of your megaphone drilled out the microscopic neural network on a chip that had accidentally been implanted in their (body parts) during (lab technique). The world is saved! While some lovely little (really stupid instrument) music is played, you all walk into an endless road between green meadows, to live happily ever after.

EVENTS IN APRIL AND MAY

Challenging Society Sessions: Remaking Nature

When: 22 May, 19:30 - 21:15
Where: Oude Lutherse Kerk

Should there be limits to the impact of humans on nature? Harvard professor Sheila Jasanoff and UvA Rector Karen Maex are going to discuss the ethical implications of the Anthropocene, the era in which the earth is shaped by human forces. Jasanoffs research focuses on the role of science and technology in modern democracies.

Why we cycle

When 01 May, 20:00 - 21:30
Where: Spui 25

A documentary screening and discussion session about the "obvious, but even more hidden effects of cycling on people, on societies, and on the organization of cities". Seems like something you should know about if you live in the Netherlands!

Women in Science

When? 9 May, evening hours
Where? Amsterdam Science park
Organized by our own board, this informational evening will be all about experiences as young women in science: from the best parts to the difficult bits, and how to manage!

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BIRTHDAYS



These spring babies are celebrating their birthdays in April and May:

Victor-Andrei Bodiut: 29th of April

Ilse van Dijk: 12th of April

Philip Oosterholt: 10th of April

George Britton: 18th of April

Floor Nelissen: 21st of April

Maud Fliers: 22nd of April

Susan van den Boogaard: 25th of April

Ghazal Nabiltehrani: 26th of April