What Do Cyborgs Gossip About in (Cyber)space?: Tracing Posthuman Discourses in the Rosetta Space Mission

Tamara Szűcs
Central European University

1. Introduction

This paper examines machine/human boundary-breaching examples in social media discourse on the Rosetta mission, a recent European space mission to a comet visiting our solar system, in order to speculate on the posthuman and perhaps even post-cyborgian implications of these transgressions.

Using Donna Haraway's conception of the cyborg as a "hybrid of machine and organism, creature of social reality as well as creature of fiction" (1991, 149) as my springboard to critically think through how the machine/human boundary was complicated and made ambiguous during the climax of the space project, I aim to show that the unstaffed spacecrafts of the mission (named Rosetta and Philae) largely fit the Harawayan definition of the cyborg in that they are both discursively constructed 'living' organisms and artificially made 'lifeless' objects. In other words, I argue that the spaceships are indissoluble assemblages of the human and machine; they are ambiguous associations that are made elusive and, somewhat paradoxically, all the more integrated by being spatially and temporally dispersed in cyberspace and outer space.[1]

But while I am drawing on Haraway's thoughts on the cyborg, I do not think that completely mapping her cyborg ideal onto the spacecrafts, Rosetta and Philae, would be possible or that this would provide a radical enough challenge to the dominance of humanist narratives and their politics of hierarchies, exclusions, and silences. This is because I understand Haraway's cyborg as a predominantly organic-human plane (still intrinsically defined with the human implicitly in the centre) which has been overlaid and entangled with myriad kinds of technological, mechanistic, and informatics creatures/creations. What I would suggest instead is that the case of Rosetta and Philae is something of a reverse-cyborg situation, where Haraway's presumed cyborg-causality is turned inside out so that the 'pre-existing' technology of the spacecrafts is enmeshed in 'added' humanistic relatability and personhood. Although constructed by the organic hands of their makers, in a sense the spacecrafts can be seen as purely artificial entities. As such,

social discourse would insist on classifying them as lifeless, non-human machines, and we would be expected to relate to them as such. However, the argument I propose here is that these inorganic machines are (re)suscitated to what I call reverse-cyborgs, where an ambiguously alien but affectively appealing human-ness is melded with the 'original' machine bodies through the social media examples that are analysed throughout this paper. This is not so much a negation of the image of the Harawayan cyborg but an invitation to think about the possibility of reverse-cyborgs and their posthuman (even post-cyborgian) potential to perhaps radically displace the human from the centre by allowing us to look at the cyborg *from the other way around*.

Within this speculative theoretical framework, the next section will provide some necessary background information on the Rosetta space mission, setting the scene for the second half of the paper, in which the machine/human transgressions and subsequent (reverse-)cyborgian becomings hinted at in the first part are demonstrated through examples selected from the European Space Agency's (ESA) Twitter accounts and mission blog, and from third-party news articles and blog posts.

2. Real life space opera with celebrity spacecrafts

As comets are ancient leftovers from the Solar System formation, examining them is expected to yield clues as to how our planetary system evolved. This makes cometary missions an integral part of the (never-ending?) quest to find out more about the origins of life (with clearly humanistic implications for the question of the 'origin of *man*'). Thus, on 12 November 2014 and for the first time in the history of space exploration, the ESA's remotely controlled spacecraft (Rosetta) sent down a smaller spaceship (Philae) to the surface of comet 67P/Churyumov–Gerasimenko (67P/C-G) to investigate its structure. The landing and surface examination were not completely successfully since after the 7-hour free fall from Rosetta, Philae landed in shadow and therefore was only operational for about 60 hours before its solar-powered batteries were depleted, shutting down the robot.[2] Scientists are hopeful that Philae will come alive again in mid-2015 as the amount of sunlight reaching the machine gradually increases during the comet's approach toward the Sun.

The ESA, its partners, and the public (indirectly through the ESA) invested much into this mission. Rosetta travelled for over 10 years and 6 billion km with the sleeping Philae on-board to reach comet 67P/C-G, with the project running up a bill of €1.4 billion in total. The mission's overall scientific and operational success can decide the fate of future ESA space ventures and whether the European public gives a vote of confidence to

these programmes. As over 2,000 scientists and engineers are involved from various space industry firms and research institutions, there are also high-flying scientific careers and research funds at stake. Recognising these interests and wishing to raise the mission's profile through increased public engagement, the ESA's press team and the mission's science teams consciously maintained a significant social media presence for Rosetta and Philae in October and November 2014, both prior to and during the comet landing.

This media presence was built up through two Twitter accounts (@ESA_Rosetta and @Philae2014), the ESA's own Rosetta blog, and regular live streams of interviews with mission scientists. The present paper mostly focuses on the machine-to-human material-semiotic discursive transformations within the official ESA Twitter conversations because (1) these appeared to be the most popular and most memorable aspects to the public and (2) both accounts consistently use first-person narratives as if the spacecrafts themselves were directly talking to each other, human supporters, and non-human supporters through the microblogging site, thus creating a curious intimacy and relatability. Arguably, it is in great part due to the online presence of the two machines that the Rosetta press campaign was remarkably successful: Rosetta and Philae became 'media celebrities' almost overnight with followers in the hundred thousands (the Philae Twitter account had around 27,000 followers the day before the comet-landing but over the subsequent two days this increased to almost 400,000 followers, with the Rosetta account seeing a similar growth in subscribers).[3]

3. Spaceships are "heart-meltingly human" – or are they?

By deploying a humanising discourse for the missions through social media, the ESA succeeded in coupling hard-to-digest niche science with contemporary modes of (digital) consumption. But, as I will show, they also contributed to the creation of the spacecrafts as (reversed) cyborgs by discursively constructing Rosetta and Philae as feeling, thinking, breathing, and, ultimately, mortal material-semiotic actors. The spacecrafts have humanised-mechanic body parts such as eyes that watch out for each other, arms that sneak into candid pictures, legs that need stretching, and backs that get chilly. They can hear and smell their surroundings, and they feel excited, nervous, tired, or sleepy. They take selfies and send each other postcards, bantering and nudging one another along the way. They jump and bounce and float, and they sleep and dream (perhaps echoing Philip K. Dick's *Do Androids Dream of Electric Sheep?*). They have a proper home address (the comet!) and they lead busy and exciting lives. They are mother and child, friends, lovers, and siblings *all at the same time*. Humans and other

anthropomorphic creatures (for instance, NASA's Mars rovers personified on Twitter) caringly look out for them, root for them, love them, and cry and mourn when Philae dies. Similarly to cyborgs, but in what I propose is a reversed and more complicated causality ([human-to-]machine-to-human as opposed to purely human-to-machine), Philae and Rosetta breach the machine/human boundary by being both real-life machines and fictional "heart-meltingly human" organisms (Ruberry, *Discovery*), while at the same time (technologically integrated) humans create and act through them.[4] Crucially, because the spacecrafts 'start out' as machines, they participate in the intimate enmeshment of non-human/human characteristics in social media *from the other way around*. I argue that this approach to the human/non-human imaginary results in a reverse-cyborgian becoming of Rosetta and Philae in opposition to Donna Haraway's human subjectivity originated cyborg, and I suggest that perhaps such a 'reversed' causality places Rosetta and Philae in a better position to subvert the centrality of the subject in modern humanism.

In line with their ambiguous similarity to Haraway's (feminist) cyborg, Philae and Rosetta could pass as genderless (Haraway 1991, 150). No gender is visible on their material surface; their mechanical bodies and scientific functions are not *originally* inscribed with the binary meanings of gender. But as a creature of (human) fiction, Rosetta is the *mother* ship; matching a feminine gender role, *she* is the provider of care and emotional support to *him*, the (infantilised) "baby space probe" Philae (Gilbert, *CNN*). In the mother-child assignment, Philae is the male child "leaving home to go out into the universe" (Said-Moorhouse, *CNN*), while mother-hen Rosetta watches over him undertaking his heroic mission and as he falls asleep later, due to his depleted batteries. Consequently, although the robotic bodies are not inherently gendered (fittingly for their reverse-cyborg image), the differential allocation of 'she' and 'he' is based on the social interpretation of the functions of the spacecrafts, discursively yielding a sexual division of labour. Due to human discomfort with the ambiguousness of the cyborg, Rosetta's body must be read and inscribed as female because she is the carrier, the one who is 'pregnant' with Philae. In opposition to Rosetta's feminised care work and support, Philae is coded as male because he is the one conducting the crucial manly work of discovering the world of the comet; he is physically conquering the cosmic rock and inseminating it with the (intellectual) seed of humanity. Ultimately, the spacecrafts could not live as genderless entities: gendering them is mandatory if they are to make sense to 'us' as agential and, above all, relatable beings who can be accepted into our social (cyber)realities. It appears that gender is a social prerequisite for (humanistic) personhood, even when it comes to cyborgs. Therefore, the

social image of their labour was used to assign the spacecrafts semantically gendered roles, with the relevant pronouns firmly maintained in their every 'utterance' on social media. So while the robots do not *originate* (that is, they were not conceived) as gendered bodies and gender as a concept would not make sense to *them*, their gender had to be purposefully assigned and put to work by the *humanist* culture they were crafted and immersed in before the robots could be legitimately enfolded into our social fiction that is clearly still very real in its (gendered) consequences.

Yet, the relationship between Rosetta and Philae is not just a mother-child bond. The machines are also narrated as siblings, with "Grandpa Giotto" (another unstaffed ESA spacecraft that studied a comet in the mid-1980s) telling them a bedtime story (European Space Agency 2014) and they are also depicted as friends with Rosetta calling Philae "buddy" and "my friend" (figures 1 and 2). These friends merrily banter away throughout the separation preparations for the comet landing, during Philae's descent to the comet, and in the wake of the landing (see panel 1 in the Appendix: Rosetta counts back for Philae and gives him advice on what to pack for the trip). There are even traces of incestuous tones in the relationship between the spacecrafts: Philae and Rosetta are related *and* relatable as lovers who are going through a "love affair millions of miles away" from Earth (Said-Moorhouse, *CNN*) and their separation for Philae's landing on comet 67P/C-G was called "the most high-profile break-up" of 2014 (*Channel 4 News*).

Figure 1. Following separation and planned loss of connection, Rosetta can "hear" her "buddy" again.

Figure 2. Rosetta congratulates her friend for landing and getting a new home address.

I suggest that the constant writing and overwriting of 'humanly' conflicting and mutually exclusive relations between Rosetta and Philae (friends, mother-child, lovers, and siblings) is part of an almost frantic scramble to create a humanist relatability and personhood for the spacecrafts, essentially *from scratch*. These cyborgian robots do not have a socially acceptable origin story: they were not organically conceived and born but mechanically planned and crafted; they are not 'natural' beings like humanity (is narrated to be) but are 'artificial' and impure assemblages. They do not come with a blood-tie based lineage, therefore they may be perceived as lacking any basis for a legitimate claim to personhood to such an extent that this lack can only be turned around and filled in by grafting and piling multiple relational ties on top of each other.

Although these relations are often 'morally' conflicting, human society makes an exception to tolerate these conflicts because cyborgs are *known* to be "monstrous" and "completely without innocence" (Haraway 1991, 151). Thus, these reverse-cyborgs too can be intimate, illegitimate, and perverse (Ibid.) but in a more alien and jarring manner than Haraway's cyborg, which I suggested is causally still only predicated on the technology-perverted human. Rosetta and Philae are not only dispersed in (cyber)space as humans living/transferred through technology but they are also machine-agents perverted by (their) humanity. I propose that while most of the 'human' crafters and supporters/followers of Rosetta and Philae are unlikely to be aware of theoretical conceptions of the cyborg as used in this paper, they (unknowingly or tacitly) accepted and embraced the monstrous perversity of the spacecrafts because of an infectious imperative to affectively relate to these charming and fallible entities, who are simultaneously familiar and foreign so that one can curiously relate to them both as the self and as the other. It is because of this relatable otherness that

Rosetta and Philae's engagement in multiple forbidden relationships (mother-child versus siblings; mother-child versus lovers; siblings versus lovers) was not perceived to pose the kind of transgressive, ruinous threat to 'normalcy' and to social order that similar relational becomings could have posed between those only familiar to us and to each other as humans.

Incestuous and forbidden relationships are not the only striking aspect of the lives of these reverse-cyborg spacecrafts. The most tragic aspect of this story is the fact that Philae and Rosetta were built with finite lifespans. What is more, these machines are so "disturbingly lively" in social media (Haraway 1991, 151) that they effectively became mortals just like the humans who crafted and befriended them – they will die sometime in mid-2015 as the comet reaches too close to the Sun. While the timing is uncertain, death is a certainty; the friends of the spacecrafts keep the unavoidable fact of death in (silent) discursive circulation by avoiding discussions of the demise of the robots, similarly to how we pointedly avoid talking or even thinking about the finitude of the lives of our loved ones.

With Philae, the dramatic mortality has been particularly compelling. The machine, which was expected to conduct scientific experiments for months on the surface of the comet, landed in shadow on 12 November 2014 and was unable to recharge its batteries through solar panels, shutting down after a mere 60 hours of work. Philae's battery depletion was broadcast on social media in near real-time (figure 3: Philae is "feeling a bit tired" and "might take a nap" and figure 4: Philae is to "rest well"; Rosetta, his supportive mother/sister/[girl]friend says she has "got it from here"), resulting in the machine being hailed not just as brave for completing the risky landing manoeuvre, but also as heroic for transmitting scientific measurements until the last moment before dying (figure 5: Philae "sniffing the comet until *the last gasp*" – emphasis added). As Philae neared the end of his life, followers flooded the ESA's Twitter accounts with hopeful theories of 'resurrection' through the power of the Sun as the comet travels closer to the star in 2015, eerily reminiscent of mythical and religious narratives. Once Philae shut down (figure 6: Rosetta thinks Philae is dreaming), supporters were said to experience a "period of mourning" for the machine (Coyne, *Why Evolution is True*), while still resolutely believing in the coming of a miraculous resurrection (figure 7: Rosetta responding to worried supporters of Philae).

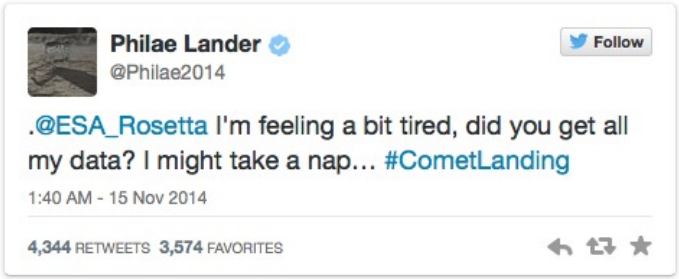

Figure 3. Philae checks in with Rosetta and indicates his batteries are depleting.

Figures 4. Rosetta responds to Philae that she has "got it from here" so Philae can "rest well."

Figure 5. Rosetta tweets about Philae doing science until his "last gasp."

Figure 6. Rosetta thinks sleeping Philae "is dreaming about science."

Figure 7. Rosetta updates worried supporters about "little Philae."

Along with the two spacecrafts, comet 67P/C-G is also made 'lively' as a humanistic but alien creature. As the date of the landing approached, published scientific data that was gathered by Rosetta's magnetometer and ion-analysing instruments deliberately attributed animate characteristics to the comet such as voice and body odour: not only can 67P/C-G sing (Mignone 2014), but Philae and Rosetta also "sniffed its perfume of rotten eggs and cat wee" (Lakdawalla 2014; Aron 2014). At the same time, the comet remains an integral and inseparable part of the 'book of nature.' It is a "tough nut" that humans can "crack" by the robotic extensions of themselves and transgress (violate?) its bodily boundaries through "drilling and hammering" into its surface (*UK Space Agency*).

Although it is seen and dissected as part of nature, the comet (similarly to the two spacecrafts) is appropriated to create 'new' scientific knowledge and used as a resource for the production of cultural values (Haraway 1991, 150). In this instance, the Rosetta mission scientists are using the colonised comet to (re)imagine the universal beginnings of the 'human

race.' But in this anthropomorphisation of the machines and the comet, it is "not clear who makes and who is being made" (Haraway 1991, 173). While Rosetta and Philae are artificial objects external to us, once Philae lands on the comet, it/he becomes the colonising discoverer 'us' in the sense that 'we have landed on a comet.' The world of the comet remains ambiguous in this narration as it is both natural and (hu)man-made: it is a *really real* "alien world" out there (figure 8), yet in a way it only exists as an imaginary construct crafted through robotic instruments, never to be directly experienced by humans. In this sense, the comet demonstrates the concept of naturecultures, which Donna Haraway built on the human/non-human melded image of her 1980s cyborg. As a natureculture emerging through the Rosetta mission, comet 67P/C-G materially and figuratively brings together in surprising ways "the organic and technological, carbon and silicon, freedom and structure, history and myth, […] and nature and culture" (Haraway 2003, 4).

Figure 8. Data from Philae shared as "science from an alien world."

4. Conclusions

This paper investigated machine/human transgressions in the European Space Agency's Rosetta comet mission and the surrounding social media rhetoric to argue that while Donna Haraway's cyborg remains implicitly predicated on a humanistic core, which is then modified by and enfolded into technology, the two spacecrafts of the Rosetta project allow us to look at the cyborg from the reverse and perhaps therefore carry a more radical potential for displacing the human subject from the centre. It was suggested that the spacecrafts do not carry marks of gender, but as genderless creatures do not make sense to us, allocating gender to them (in part through Twitter conversations) is a prerequisite of accepting them into our social realities. Similarly, while they are deeply embedded in a web of

networks, the spacecrafts lack blood-tie based origins and relations (they were not born but made), so in a rush to make them humanly legible, multiple conflicting relations were grafted onto their bodies that eventually acquired not just origin(s) but also mortal ends. The spacecrafts could live within these mutually exclusive relationships because cyborgs are impure, perverse, and alien; and yet, they are also familiar to us in more than one sense. Ultimately, comet 67P/C-G and consequently the entire Rosetta story are part of what Haraway called naturecultures, where the dichotomic elements of the human/machine/nature imaginary co-emerge and coexist in surprising and potentially subversive ways.

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[1] A note on quotation marks: in this paper, double quotes ("...") are used for direct quotations from other (referenced) sources, while inverted commas ('...') are used in a gesture of doubt or skepticism as to what the marked concepts may signify – this is to express discomfort with these words but at the same time take responsibility for using them.

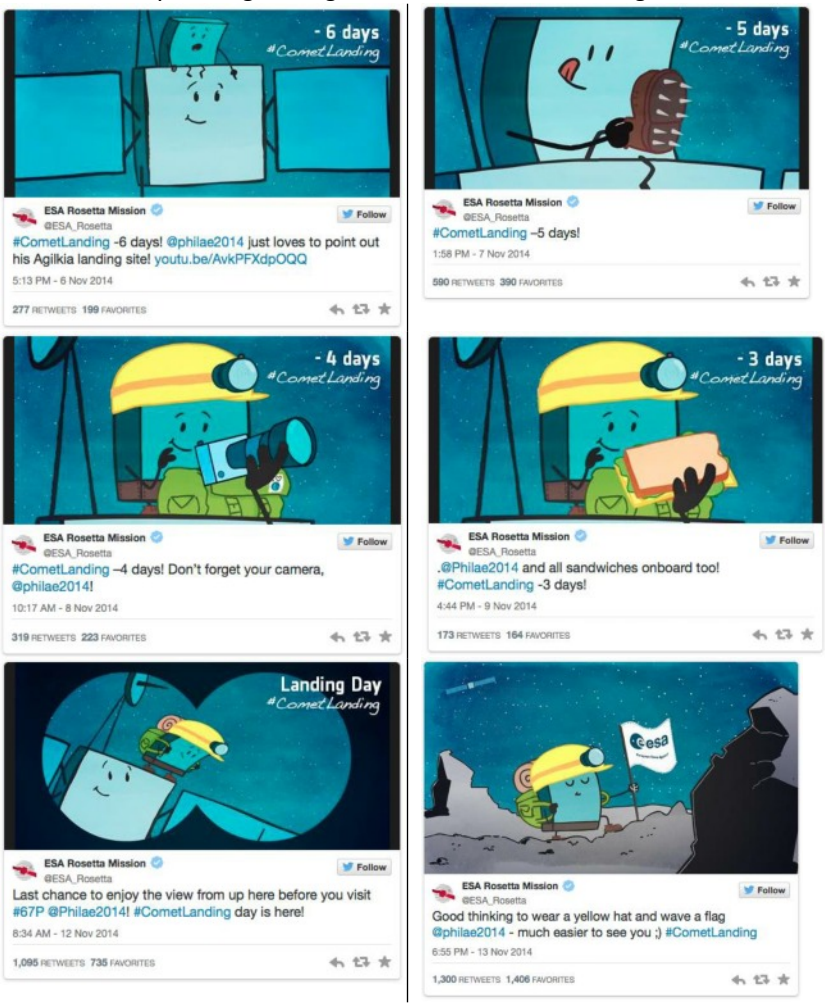
[2] For an official yet very accessible story about Rosetta, Philae and the dramatic comet landing, the reader is advised to consult the ESA's brief cartoon titled "Once upon a time... #cometlanding," which provides an impressively factual account of the missions operational and scientific milestones, such as the Go/NoGo checks before starting the landing, Philae's unresponsive harpoons and the resulting multiple landings, the breaking of Philae's hammer during one of the experiments, the depletion of Philae's batteries, and its eventual shut-down.

[3] For comparison, the followers of the ESA's non-anthropomorphic Twitter account for a Rosetta-like spacecraft, Gaia (operated under @ESAGaia since early 2009), is numbered under 10,000. Data correct as of 2 January 2015, sourced from www.twittercounter.com.

[4] As it would be difficult to demonstrate all mentioned examples within this paragraph, some of the human/machine transgressions are showcased in the appendix to indicate the general idea.

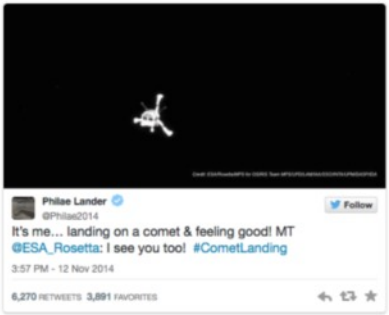
Appendix – panels 1,2,3 and 4

Panel 1. Collection of tweets from Rosetta, counting back the days to Philae's landing and featuring Philae as, variously, putting on his trekking boots, packing sandwiches, stowing away his camera, as ready to jump, and then finally sticking his flag into the comet after landing.



Panel 2. Just before and after separation, Rosetta and Philae are chatting about getting/giving a nudge for the jump, feelings of floating and a chilly back, and about sending postcards to each other.

Panel 3. After separation and whil in descent, Philae sends a postcard to Rosetta – of the mother-ship. In response to Philae's postcard, Rosetta also posts a picture back to Philae feeling good. Then Philae notes he is quite photogenic and thanks Rosetta for watching out for him.



Panel 4. Philae responds to the Mars Curiosity Rover (NASA's anthropomorphic Twitter account for one of the Mars rovers), who is rooting for Philae, and a third-party Twitter account for 'The Solar System' reassures ESA and Rosetta that Philae is in good hands.

The Twitter posts in this appendix are from the "ESA Rosetta Mission" account (https://twitter.com/philae2014); last accessed on January 2015.