

# CONDITIONED REFLEXES AND THE SYMBOLIC ORDER: A LACANIAN ASSESSMENT OF IVAN PAVLOV'S EXPERIMENTAL PRACTICE

Hub Zwart

## Introduction

In his *Écrits* as well as in his *Seminars*, Jacques Lacan refers to twentieth-century research fields such as ethology and linguistics to elucidate the specificity of a psychoanalytic diagnostics of the human condition. While ethology and Gestalt psychology enable him to explain how animals dwell in an imaginary world (where particular stimuli – e.g. the images of potential predators, partners or preys – incite particular behavioural responses), Saussurean linguistics allows him to analyse how human beings exist in the symbolic order (as a typographic ambiance). Against this backdrop, Lacan was especially intrigued by the experimental work of Ivan Pavlov (1849-1936), a contemporary of Freud and a key precursor of twentieth-century psychology (notably behaviourism and the concept of social engineering). On various occasions (both in his *Seminars* and in *Écrits*), Lacan commented on Pavlov's key discovery (the conditioned reflex) which, as Lacan phrases it, can be regarded as the instalment of a signifier and as the creation of a rudimentary symbolic ambiance.

In animal laboratories, experimenters use research animals (model organisms, removed from their natural habitats) as laboratory gadgets and as targets of manipulation, often focussing on specific partial objects within the organism. According to Lacan, Pavlov's laboratory was a *symbolic* environment (1957-1958/1998: 340). All items were carefully selected, all activities were standardised (via experimental protocols) and all events were meticulously recorded. Signals acted as signifiers to which animals learned to respond by producing certain quantities of bodily fluids, notably saliva or gastric excretions (1957-1958/1998: 339). In Pavlov's case, however, laboratory dogs allegedly played an active role, up to the point of becoming 'partners' whose contributions were acknowledged in academic publications.<sup>1</sup>

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<sup>1</sup> In publications, Pavlov formally thanked his dogs for their assistance: '[T]his method was adopted as a result of a hint given by one of the dogs subjected to the operation. We gratefully acknowledge that by its manifestation of common sense the dog has helped us as well as itself' (1955: 89-90); For Pavlov, the dog was 'almost a participant in the experiments conducted upon it, greatly facilitating the success of the research by its understanding and compliance' (Todes 2002: 52).

On closer inspection, however, a more suspicious analysis suggests that these oral and gastric substances were actually produced by the experimenters themselves, using the animals as mere machines, as living reactor vessels (Lacan 1964/1973: 254-55). The perceptivity of research animals was tested and trained, but a genuine dialogue never came about (Lacan 1957-1958: 340). Although these dogs actively (or even eagerly) participated in the research, they never became equals. And although the laboratory setting functioned as a scaffold for establishing certain signals as signifiers, their meaning was limited to the interaction between the researchers and their dogs, so that the latter never really learned a language. In short, the access of Pavlov's dogs to the scientific laboratory as a symbolic ambiance was limited.

Ideally, animal laboratories are perfectly organised settings which satisfy all animal needs, thereby reflecting a modernistic, utopian ideal (Lacan 1957-1958/1998: 461), a brave new world, perfectly managed with the help of science and technology (1957-1958/1998: 463). This explains why the communist leadership (notably Lenin and Trotsky) were firmly supportive of Pavlov's work: they saw his laboratory as a window into the future and as a model version of a future communist society. In reality, however Pavlov's laboratory was not that animal-friendly at all. It produced animal suffering in various forms (as unintended by-product of the research), resulting in various kind of symptoms. Pavlov even noticed 'experimental neurosis' among his dogs (Lacan 1966: 273; 1962-1963/2004: 72). His lab was a pathogenic environment, a totalitarian regime that cared for its animals but exploited their bodies as production factors, while eventually it was the scientific Master who enjoyed the fruits of the dogs' labour, in the form of publishable knowledge. The laboratory was a knowledge factory driven by desire, by a will to know, but also by a will to power, a desire to acquire behavioural control (1964/1973: 264; cf. Zwart 2014).

In this paper, I will subject Lacan's comments on Pavlov's experiments to a close rereading in order to explore how Lacanian psychoanalysis allows us to assess the dynamics of Pavlov's research practice (as an epistemic case history). At the same time, precisely because Pavlov's experiments can be regarded as the enactment of the coming into being of the signifier, a mutual exposure of psychoanalysis and classical conditioning may help us to elucidate some of Lacan's basic concepts. For indeed, Pavlov's research facilities replicate the *Urszene* (the primal scene) of the symbolic order (in the beginning was the signifier, as an intrusion into the metabolic cycle of needs).

The design of my article is as follows. First, I will point to the crucial role of animal research in the development of two core Lacanian concepts, namely the imaginary and the symbolic. Subsequently, I will assess Pavlov’s research practice from a Lacanian perspective, as a specific instantiation of what Lacan (1969-1970/1991) refers to as university discourse:

S <sub>2</sub> (knowledge produced by experimental researchers as <i>agents</i> )	<i>a</i> (the allusive, questionable <i>target</i> of research)
S <sub>1</sub> (the disavowed <i>truth</i> : Pavlov’s laboratory as exemplification of the ideology of social engineering)	<i>\$</i> (animal suffering as <i>by-product</i> ; experimental research as an impossible profession)

My Lacanian assessment of classical conditioning will focus respectively on: (a) the process of knowledge production through experimental technoscience (S<sub>2</sub> in the upper-left position, the researcher as *agent*); (b) classical (Pavlovian) conditioning as a paradigmatic exemplification of a communist ideology (social engineering as Pavlov’s philosopheme or guiding idea: S<sub>1</sub> in the lower-left position, as the disavowed *truth* of Pavlov’s research); (c) the role of saliva and gastric juice as objects of scientific desire (the object *a* in the upper-right position); and finally (d) the issue of physical and psychic suffering of animals as ‘victims of science’ (Ryder 1975), notably in the form of experimental neurosis, and its consequences for experimental research as an ‘impossible’ profession (*\$* in the lower-right position, as unintended *by-product*).

### **Preliminary analysis: Lacan and animal research**

Lacan’s oeuvre is dedicated to an objective which, at first glance, may seem rather paradoxical, namely the objective to *return to* Freud, not only by carefully rereading him, but also by radically *rephrasing* his work, in dialogue with the evolving vocabularies of twentieth-century science, including experimental ethology and modern linguistics. This objective (this therapeutic intervention) was based on a critical diagnostics of post-war psychoanalytical discourse. According to Lacan (1966: 244), psychoanalytical discourse had deteriorated because Freud’s oeuvre had been ignored, forgotten and obliterated. Moreover, as the psychoanalytic community went into exile and migrated (notably to the United States), psychoanalytic discourse had become susceptible to the logic and mentality of behaviourism (Lacan 1966: 245), a form of ‘human engineering’ (ibid 246) aimed at facilitating adaptation of individuals to a challenging and competitive social environment. To segregate psychoanalytic discourse from human engineering and behaviourism again (more generally:

from the discourse of the human sciences), Lacan proposed to return to Freud by rereading him in a careful, verbatim manner. Not, however, in the sense that Freud should function as a Master, an authoritative voice, a guarantee of truth ( $S_1$ ), unleashing a servile and apologetic form of discourse, which Lacan would later refer to as the discourse of the Master (Lacan 1969-1970/1991). In such a discourse, Freud experts ( $S_2$ ) function as privileged recipients or authorised custodians of an unquestionable dogma. Rather, Lacan aimed to recover the unique dynamics of psychoanalytic discourse as a discourse *sui generis* (later reframed as the 'discourse of the analyst'), revolving around the discovery of unconscious desire (the Freudian truth event). Psychoanalysis is neither as Master's discourse, Lacan argues, nor a particular branch of 'university discourse'. Although psychoanalysis is bent on elucidating the experiences and utterances of human subjects, Lacan emphasises that it is not a human science, for he sees the latter as intimately connected with psychological *engineering*, technocracy and human resource management (1966: 859).

Paradoxically, however, while proposing this return to Freud, Lacan at the same time contends that Freud himself was not really able to specify the uniqueness of his intellectual endeavour, notably because of his reliance on nineteenth-century science as his frame of reference (in other words: his lack of familiarity with post-1900 scientific developments). Freud was acquainted with Darwinism and Victorian anthropology (which he incorporated in *Totem and Taboo* for instance), but much less familiar with scientific movements such as Saussurean linguistics or Gestalt psychology, whose histories coincide more or less with the history of psychoanalysis. In order to elucidate the singular epistemological profile of psychoanalysis as inaugurated by Freud, Lacan explicitly draws on these twentieth-century research fields: first of all on linguistics and ethology, but also on later developments such as cybernetics, molecular biology and computer science. Linguistics and ethology were especially important for Lacan because they allowed him to elucidate the two basic registers or dimensions of human experience as revealed by psychoanalysis, namely the imaginary and the symbolic (as two different strategies for addressing the real).

Modern linguistics, Lacan argued, studies the symbolic order, notably the role and primacy of the signifier, functioning in networks of signifiers, and opening up a new dimension of experience, accessible via language and thereby broadening our temporal and spatial horizon. Language allows us to speak about (and to fear or desire) things we cannot see or hear, things which may have existed in the past, or may come to exist in the future, things which are ungraspable (in the literal sense of the term), and this includes technoscientific entities such

as genes, neutrinos, Higgs bosons and synthetic cells. They primarily function as signifiers, i.e. as elements in networks of concepts, visible on PowerPoints or computer screens perhaps, but the actual connection with visible and tangible entities (between words and things) remains questionable.

In a similar manner, Lacan argues, modern ethology allows us to elucidate the imaginary dimension of experience. According to Lacan, animals inhabit an imaginary world. They respond to certain visual forms (as described by Gestalt psychology) for instance, which function as stimuli triggering certain responses (as part of the animal's behavioural repertoire). To some extent, human experience remains susceptible to the imaginary as well. The image (gestalt) of a dangerous carnivore (*Jaws*), or a monstrous dinosaur (*Jurassic Park*), or a human-like hybrid (*Frankenstein*), or the enlarged image of a praying mantis (providing a detailed impression of the insect's inexorable jaws and eyes, Lacan 1961-1962: 120) may invoke in us a sense of fear, triggering certain physiological reactions, such as a fight, flight or freeze response, measurable and quantifiable with the help of precision instruments, in the context of psychological experiments for instance. Likewise, young, cuddly, furry animals may invoke in us an emotional-behavioural repertoire of sympathy and caring. Yet, Lacan argues that, also in their dealings with animals, humans predominantly dwell in a symbolic world, and our relations with animals are first and foremost structured in a symbolic manner.

Take for example heraldic symbols used by medieval knights on shields or coats of arms (Lacan 1956-1957/1994). These lions or eagles did not serve to frighten or deter opponents. Rather, they functioned as symbols expressing allegiance to a particular house or clan, allowing the knights involved to distinguish friend from foe, even in the heat of battle.

The cover of Lacan's first Seminar (Lacan 1953-1954/1975) bears the image of a large elephant with impressive white tusks, although elephants are mentioned only in passing. Again, although it is evident that the *image* of a large elephant may evoke in us a sense of admiration, fear or terror, and may therefore perhaps give rise to a fight, flight or freeze response (depending on the circumstances), modern humans primarily interact with such animals in a symbolic manner. Our understanding of animals such as elephants is infected by language as it were, by language in general, but notably by the language games of modern science (Zwart 2014). Science classifies these animals (labelling them as 'pachyderms', for instance), but also monitors and keeps count of them, and may even list them as endangered species. The fact that humans at a certain point coined the word *elephant*, Lacan argues, is the single most

important event in this animal's entire history. It is because we have the signifier 'elephant' at our disposal (as an element in scientific and political networks of signifiers) that we are able to deliberate about its future, make decisions and design policies that determine the elephant's future fate. According to Lacan, animals themselves do not enter deliberations of this kind. They dwell in a different, imaginary world, dominated by images (functioning as stimuli triggering responses). Our relationships with animals are mediated in a very fundamental way by taxonomies, regulations, quantifiable indicators and the like. They are grounded in the symbolic order: the world of names and numbers, laws and treatises, stock taking and population counts. Against this backdrop, Lacan developed a special interest in Pavlov's research practice (classical conditioning).

### **Classical conditioning and the production of knowledge (S<sub>2</sub>)**

Ivan Pavlov (1849-1937) was a contemporary of Freud. Like Freud, he received his training from representatives of the famous German school of physiology (Ernst Brücke in the case of Freud, Carl Ludwig in the case of Pavlov). After returning to St. Petersburg, Pavlov became professor of physiology at the Medical Academy and director of the physiological department of the Institute of Experimental Science. His early work with dogs dealt with digestion. For his book *Lectures on the Work of the Digestive Glands* (published in 1897), he was awarded the Nobel Prize in 1904. Various authors point to analogies between Pavlov's experimental work about excitation and inhibition and Freud's views on repression and adjustment (Windholz 1990). In *Jokes and Their Relation to the Unconscious* (1905/1940: 225), Freud himself mentions Pavlov in the context of mistaken expectations, suggesting that Pavlov's dogs, producing saliva in response to the food they expect to receive, are victims of deception. Notwithstanding these correspondences, however, Lacan himself emphasises the difference between the two, also to elucidate the extent to which psychoanalysis (as an endeavour *sui generis*) differs from contemporary psychology, notably behaviourism and other forms of 'human science'. The latter, Lacan argues, are focussed on the rational management of human resources, rather than on self-knowledge and working-through.

Pavlov's oeuvre concurs with what Lacan (1969-1970/1991) refers to as university discourse, which can best be explained by comparing it to the Master's discourse:

S <sub>1</sub> (authoritative voice as agent)	S <sub>2</sub> (expert recipients as custodians)
\$ (suppressed questionability)	a (intellectual jouissance as by-product)

The discourse of the Master builds on an authoritative voice, a guiding source (S<sub>1</sub>), such as the book of *Genesis* for instance, which functions as starting point for the production of scholarly knowledge concerning nature. Scholarly experts (S<sub>2</sub>) act as qualified recipients, and their discourse typically consists of apologetic glosses and comments. Uncertainties or doubts, which must have tormented the anonymous authors of these authoritative sources in real life, are disavowed (\$ pushed beneath the bar). Although it is a servile type of discourse, it offers intellectual jouissance to the scholars involved, for instance because it allows them to recognise the fingerprints of God in various marvels of creation (in particular insects or flowers for instance). Such marvels are singled out as objects (a) of intellectual desire, of the experts' *cupido sciendi*, the scholarly will to know.

University discourse is the result of a scientific revolution: an anti- clockwise quarter-turn of the quadruped scheme. The academic experts (S<sub>2</sub>) have emancipated, so that they themselves now occupy the (upper- left) position of the agent, addressing, questioning and exploiting particular objects (upper-right position), allegedly in a disinterested and objective manner. The authoritative source providing guidance (S<sub>1</sub>) is pushed into the lower-left position (below the bar). Qualified experts (S<sub>2</sub>) rely on technical, experimental skills rather than on ideological guidance, and interact with their research targets via technological contrivances (laboratory props and experimental techniques).

On closer inspection, however, things prove much more complicated, as indicated by Lacan's quadruped scheme. On the left-side of the scheme, a disavowed ideological truth may still be at work, for instance: the desire to promote a modern scientific (say: Darwinian) worldview (at the expense of creationism), or the desire to promote social engineering as a utopian ideal. On the right-side of the scheme, the target of research (a) is not the natural, living organism as such, but something more partial, specific and elusive, something 'else' to which the research animal at hand is expected to provide access. Yet, the target of research may prove a rather intractable, allusive object: an obstacle rather than an opening, a source of frustration even, to such an extent that scientific researchers become tormented subjects (\$), unable to live up to academic requirements and expectations. Their object of research becomes an obsession,

trapping the researchers involved, draining their energy and wasting their lives. Eventually, not only the research animals (sacrificed to the progress of experimental knowledge production), but also the researchers themselves may become ‘victims of science’ ( $\$$  as unintended by-product in the lower- right position):

S <sub>2</sub> (the qualified, experimental researcher)	$a$ (elusive target of the knowledge process)
S <sub>1</sub> (the disavowed ideological truth)	$\$$ (animal suffering and tormented subjects, researchers as victims of science)

This quadruped scheme also applies to Pavlov’s paradigmatic research with animals as conducted in his laboratory (in St. Petersburg / Leningrad). The experimental researchers (equipped with laboratory technologies) act as agents: as initiators of the discourse and as *producers* of scientific knowledge (S<sub>2</sub>). Their objective is to manipulate the object: the research animal, or rather: a specific ‘partial object’ ( $a$ ), using specific organs of animals (stomachs, salivary glands, etc.) to produce certain substances which can subsequently be measured and transformed into quantitative data, publishable in journals and citable by others (as the surplus value of the products produced by experimental organisms). Pavlov’s research was initially focussed on metabolism. The *independent variable* was a certain amount of food (e.g. meat on a plate), while the *dependent variable* was the research animal’s response, e.g. the secretion of body fluids, notably saliva or gastric juice, in response to the food presented. Pavlov made small openings (windows of fistulas) in the throat or stomachs of his animals to collect these secretions, so as to measure and analyse the samples (the object  $a$ ) as carefully as possible. Thus, saliva and gastric juice (slimy substances, which may be regarded as detestable in normal life) became highly valuable entities, representing the ‘animal other’, but condensed into an unpalatable sample of fluid (the object  $a$  of Pavlov’s research: Lacan 1972-1973/1975: 183). Psychoanalytically speaking, this focus on gastric juice or drops of drool (as symptoms of conditioning) added a perverse twist to Pavlovian research, reflecting the perverse jouissance so often involved in scientific experiments. For indeed, science quite often displays a remarkable interest in substances such as saliva, urine, stool, cervical smear or cheek swap samples, produced by erogenous orifices (mouth, penis, vagina, anus) and serving as windows into the condition of the organism as a whole.

In the context of his experimental work, however, Pavlov discovered (around the year 1900)



that his dogs not only responded to the sight or smell of meat, but also to certain signals associated with it, such as the opening of a door or the sound of a bell. Thus, in the context of a physiological research program formally devoted to studying mammal metabolism, he unexpectedly made his most famous discovery: the conditioned reflex as an elementary building-block of twentieth-century psychology, notably behaviourism and learning theory. Because of this discovery, he decided to shift the focus of his research from (nineteenth-century) animal physiology to (twentieth-century) animal psychology. Pavlov's version of the university discourse can be represented as follows:

S <sub>2</sub> (knowledge produced by experimental experts)	a (bodily secretions as substances of value)
S <sub>1</sub> (the political ideological truth)	§ (frustrations: the divided subject)

S<sub>2</sub> is (the discourse of) the experimental expert, producing reliable (quantified, replicable) knowledge via an experimental design, allowing researchers to quantify and manipulate animal behaviour. S<sub>2</sub> functions as the *agent*: the initiator of the knowledge production process. The research animal acts as the 'other', the *recipient* to which the researchers' questions are addressed and whose products (produced in response: e.g. saliva and gastric juice) are appropriated by the experimenter. Interestingly, however, in the case of Pavlov, the research animal is almost treated as a partner. His dogs are described as cooperative animals, as partners in the research, as almost-human research subjects and as members almost of the team (Todes 2002: 52), – the researcher's best friend.<sup>2</sup> In publications, Pavlov expressed his gratitude to his dogs, formally thanking them for their assistance.<sup>3</sup>

On closer inspection, however, Pavlov is not interested in these friendly participants at all. Ultimately, his *cupido sciendi* (his will to know) is focussed on something very specific, something which is completely independent of the animal's willingness or gusto to participate, namely a certain type of bodily fluid, produced by certain organs, in response to certain signals manipulated by the researchers, and collected and appropriated by the laboratory system.

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<sup>2</sup> Pavlov's favourite dog, whose cooperative behaviour contributed greatly to the writing of his Lectures, was called Druzhok (Little Friend).

<sup>3</sup> Pavlov emphasises that 'physiology in general owes much to the intelligence of the dog' (1955: 104).

This already suggests that, in order to really understand what is happening between researcher and animal above the bar, we must also pay attention to what is happening beneath the bar. First of all, although the research is presented as ‘disinterested’ and ‘purely scientific’, one of the reasons for Lacan’s interest in Pavlov’s work is that it reflects the philosophy and zeitgeist of a particular political ideology (an ideological universe even), namely communism as a twentieth-century creed ( $S_I$  in the lower-left position). The conditioned reflex provides a powerful tool for social engineering. Sooner or later, research animals will be replaced by humans, and scientists will become the social engineers of the human psyche. Pavlovian psychology (and for Lacan, this applies to the human sciences as such) is a style of research driven by *interest*. It is interested in developing effective, evidence-based tools for manipulation and exploitation. Ideally, society as a whole becomes structured as Pavlov’s laboratory (i.e. Pavlov’s laboratory as a small-scale, anticipatory model of an ideal state, a window into the communist future).

### **Pavlov’s research as window into a brave new future (the philosopheme of social engineering, $S_I$ )**

The concept of the conditioned reflex (coined by Pavlov in 1901) is symptomatic for the transition from nineteenth-century science to twentieth-century science. Before 1900, Pavlov contributed to the research paradigm of the German physiological school, represented by Brücke, Ludwig and others. By introducing the conditioned reflex, however, Pavlov inaugurated a new style of research, destined to evolve into behaviourism and learning theory. This transition reflected a transvaluation of values, replacing the nineteenth-century desire to *understand* living beings by the twentieth-century desire to *manipulate* living organisms, in accordance with Jacques Loeb’s claim (pronounced around 1900) that *biology* should become *biotechnology*, bent on optimising rather than on understanding nature (Pauly 1987).

Pavlov personified the emergence of a research field based on disciplined, manual labour and destined to replace a more spiritual and artistic view on human existence. In other words, he personified the type of research advocated in an anticipatory manner by Bazarov in Turgenev’s famous novel *Fathers and Sons* (1861-1965; Todes 2014: 32; Zwart 2008: 99). Turgenev’s classic novel analyses the generation conflict between artistic, romantic fathers (dedicated to art and novel-reading) and their technoscientific sons (bent on exploring and reengineering nature, notably with the help of animal experiments). The claim that research should aim to control and manipulate the object (the living organism) is the basic conviction of this type of research: its guiding philosopheme ( $S_I$  in the lower-left position), in combination with the

relentless imperative of the new scientific knowledge-power regime, namely to produce more knowledge: never enough! (1969-1970/1991: 120-21). Pavlov's research can be regarded as the technical realisation of something which, in the 1860s, was still a utopian (or dystopian) literary dream. Pavlov's experimental method is developed in a laboratory context, but may subsequently be extrapolated into society as such, in the form of social engineering, so that political utopianism gives way to science, as Friedrich Engels once phrased it (Engels 1880). The laboratory becomes an outpost gazing into the future, a theatre where segments of this future can be systematically probed and tested (Zwart 2009). What works with dogs may later be tried on humans. A visitor of Pavlov's facility may well have felt like the American journalist Joseph Lincoln Steffens who, after visiting the Soviet Union (during the heydays of technoscientific utopia), claimed: 'I have seen the future and it works' (Kaplan 1974).

This explains why the communist regime was very supportive of Pavlov's research and why Lacan sees Pavlov's work as symptomatic for soviet communism as such. After speaking with Pavlov, Lenin proclaimed his desire to re-educate the Russian people as an animal trainer would (Figs 1996). In October 1919, Lenin allegedly paid a secret visit to Pavlov's laboratory to find out how the work on conditional reflexes might help communism to control human behaviour. The ultimate aim of communism was to improve human beings and to transform human nature. Although Pavlov was critical of communism, he was patronized by the Bolshevik regime. Lenin spoke of Pavlov's work as hugely significant for the revolution and Trotsky saw the production a new, improved version of humankind as the great task of Communism, using current humanity as raw material, or as a semi-manufactured product. In 1923, Trotsky wrote to Pavlov arguing that, whereas Freudians assumed an artistic stance towards human existence, Pavlov opted for an experimental, physiological approach (Windholz 1990), so that his reflex doctrine might provide a physiological substructure to Freudian theories (Todes 2014: 500). Despite its literary tendencies, he argued, psychoanalysis could be encompassed as a special case of doctrine of conditioned reflexes (Roudinesco 1986: 50). Later, however, Pavlovian psychology became the official doctrine and in 1949 it was formally declared that Pavlov had demolished 'the Freudian house of cards' (Roudinesco 1986: 53). On January 24, 1921, a formal Decree was published on Pavlov's research (Lenin 1921-1965: 69), indicating that, in view of Pavlov's outstanding scientific services, which were of tremendous importance to the working people of the world, a special committee was established to guarantee the best conditions for research. While 'the academician Pavlov's laboratory' would be furnished with every possible facility, Pavlov and his wife would receive a special food ration, equal in caloricity to two normal academic rations. Ironically, Pavlov

himself was regarded as a kind of experimental dog by the communist authorities, encouraged to continue to produce his products by installing a specific signifier (the formally signed decree) signifying the advent of more food (during a period of massive deprivation and starvation). A specific form of scientific work is singled out as being of strategic importance.

According to Lacan, the aim of communism was to reorganise society on a rational basis, transforming it into a large-scale laboratory for social engineering. The Soviet Union, Lacan argued, was a society which was completely under the sway of university discourse<sup>4</sup>: a society ideally designed by political engineers and devoted to producing strategic products. He saw the Soviet Union as decidedly science-based, relying on physics, dialectical materialism and social engineering (Zwart 2017a: 34). A similar wave of social engineering and human resources management could be discerned in capitalism as well, however, notably in the form of Taylorism, Fordism and other instances of Americanism. While Pavlovian knowledge ( $S_2$ ) could provide scientific input for communism, Pavlov's work could be regarded as the realisation or condensation of an ideology of social engineering, of an ideological philosopheme ( $S_1$ ), reaching out to Pavlov's activities from beneath the bar as it were.

Let this suffice as an analysis of the relationship between Pavlovian knowledge ( $S_2$ ) and the philosopheme of social engineering ( $S_1$ ). In the next section, focus will shift to the object pole of the knowledge relationship, because Lacan was interested in Pavlov's work first and foremost because of what happened at the right side of the quadruped.

### **Salivating others (bodily secretions as object *a*)**

For Lacan, the experimental situation constructed by Pavlov's research practice represented a bridge between the animal and the human world, between the imaginary and the symbolic. Pavlov discovered something which may seem obvious: something which is known since time immemorial from every-day life-world experience, namely that humans communicate with dogs (and other domesticated animals) via signals (such as whistles and bells). Pavlov verified this experimentally, however, under controlled conditions, recognising its importance and turning it into the basic building block of a prestigious research program. The fact that dogs may be trained to respond to the sound of a whistle is common knowledge, but Pavlov's

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<sup>4</sup> *'Ce qui règne dans ce qu'on appelle communément l'Union des républiques socialistes soviétiques, c'est l'université'* (1969-1970/1991: 237).

prestige stems from the fact that, with the help of specific signals and plates of meat, he demonstrated exactly how this worked, namely via the conditioned reflex as the elementary building block of animal and human behaviour.

For Lacan, however, the question is whether, by learning to respond to signals, these research animals really entered the symbolic order. In other words: whether these signals can be regarded as signifiers, as symbols, as elements of a language. In *Écrits* (1966: 273), Lacan phrases the question somewhat jocularly as follows: if we can teach animals to respond to the sight of a printed menu (by producing saliva, for instance), can they also learn to consider the various prices that are listed on the card? And is the gastric juice produced by the dogs comparable to similar visceral reactions of humans in response to terms like ‘contract’ or ‘marriage contract’? These and similar remarks suggest that, according to Lacan, there is still an unsurmountable difference or gap separating the human from the animal world. In the case of humans, Lacan argues, the stimulus (the word ‘contract’, used in an experiment which measures reaction time, for instance) is a linguistic element functioning in a network of signifiers. In Pavlov’s experiments, however, the sound of a bell remains a stand-alone signal, only valid within the interaction between researchers and research animals. In Pavlov’s laboratory, the signal actually indicates the presence or advent of a human subject (the research associate, conducting the experiment). Lacan explicitly mentions Pavlov- style experiments in which animals are conditioned to differentiate between a circle and an ellipse (Lacan 1966: 141). Have these animals acquired mathematical knowledge when they begin to salivate as soon as they see circle rather than an ellipse?

In order to further elucidate this difference, Lacan uses the role of foreplay in human eroticism. Besides the erogenous zones directly involved in intercourse, other bodily surfaces may become involved in eroticism as well, as targets for various preparatory (seductive) courtship activities, or even as substitutes for sexual intercourse, so that lovers may kiss the lips, hands, ears, hands, shoulders, forehead, etc. of beloved others, thereby expressing and triggering erotic desire. Certain gestures (blinking an eye, for instance) may work as a signal, but in the case of human eroticism, these auxiliary activities may even expand to things like poetry or music as aphrodisiacs. As Lacan phrases it, although we may discern the functioning of the unconscious in the ‘peristaltic movements of a Pavlovian dog’, in humans it also expresses itself in eloquent and elaborate literary genres, such as macaronic poetry, courtly tablature and Gongorismo (Lacan 1966: 467). Thus, in the world of human love, a trans- natural, symbolic sphere is opened up. Although also in the case of humans conditioned and unconditioned

reflexes will incite the production of saliva, sperm and vaginal fluids, and may even unleash peristaltic spasms in response to certain aversive stimuli (Lacan 1966: 817)<sup>5</sup>, Lacan maintains that human erotic desire differs from animalistic behavioural circuits. When it comes to articulating the difference more precisely, however, Pavlov's experiments are of significant value.

Pavlov's experiments are focussed on the presence or absence of certain quantities of bodily fluids, such as gastric juice and saliva, which, under normal circumstances, may be regarded as worthless or even detestable. In the context of Pavlov's research, these substances suddenly become highly significant and valuable, to such an extent that countless experiments are dedicated to producing them, turning these substances into the 'object *a*' of this type of research, but why? What exactly does a specific quantity of gastric juice or saliva signify? For Lacan, Pavlov's experiments are important because they demonstrate (under controlled laboratory conditions) the birth, the implementation of the signifier. They allow us to witness how an apparently arbitrary signal (the sound of a bell, the shape of a circle, etc.) may acquire a certain meaning and may convey a certain message ('salivate!'). It is, as Lacan phrases it, the staging, the *mis en scène* of the signifier (Lacan 1967-1968: 8). It demonstrates how a formerly meaningless signal may suddenly unleash a measurable bodily impact. The signifier, once established, announces the advent or presence of a human subject, the experimental researcher (1962-1963/2004: 72). It is a molecule of language, as it were.

That a personal bond between researcher and research animal is developed (or reinforced) in the course of the experiment is no coincidence (1967-1968: 9), for the animal's love and attachment is established via food. As Lacan phrases it, Pavlov was 'a structuralist' (ibid.: 8; 12), a structuralist *avant la lettre* and of the strictest observance even. He was interested in the functioning of the elementary components of the symbolic order, and the conditioned reflex is the elementary segment of a symbolic system which operates without any reference to something 'spiritual', to things like intentionality, self-consciousness a soul, etc. (Lacan 1967-1968: 8). Via conditioning, domesticated animals enter our world (our symbolic environment) to some extent. The signal can be anything (a sound, a circle, etc.), for the signifier is something completely arbitrary. Also, Pavlov's experiments confirm what Lacan refers to as

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<sup>5</sup> *La délimitation même de la "zone érogène" que la pulsion isole du métabolisme de la fonction (l'acte de la dévoration intéresse d'autres organes que la bouche, demandez-les au chien de Pavlov) est le fait d'une coupure qui trouve faveur du trait anatomique d'une marge ou d'une bord: lèvres, "enclos des dents", marge de l'anus, sillon pénien, vagin, fente palpébrale, voire cornet de l'oreille... L'érogénéité respiratoire est mal étudiée, mais c'est évidemment par le spasme qu'elle entre en jeu' (Lacan 1966: 817).*

the primacy of the signifier. Once established, the emergence of the signifier suffices to elicit the behaviour in question (in response to the signified, i.e. the idea or expectation of food). Even if food is not really involved, the signal unleashes the response.

And yet, Pavlov's experiments also show that the signal is *not really* a signifier (Lacan 1964/1973: 254) and that the animal does *not really* learn a language. The signal is only locally valid (within the laboratory context), Lacan argues, and functions solely in the relationship between researcher and research animal (allowing the researcher to manipulate the latter). Such signals do not evolve into a language (an autonomous network of signifiers), and they remain rudimentary linguistic components. It is a temporary ad hoc language at best. The conditioned reflex shows that the experimental set-up allows us to make a cut (and to introduce a detour) in the circuit of bodily needs, but it also shows why an animal will never really learn to speak (Lacan 1964/1973: 263). The desire involved in the experiment, the desire that is put at risk and questioned, is the desire of the researchers themselves (ibid 264): it is *their* will to know, their *cupido sciendi*, focused on (or obsessed even) by the presence or absence of saliva and gastric juice, not because of the use value (nutritional or otherwise) of these fluids, but because they demonstrate that behaviour is open to manipulation, that social engineering is possible in principle. The responses which are registered, somewhere in the animal's organic system, are not an 'answer' to a question. Rather, they reflect and mirror the activities of the experimenters themselves. The interaction is *not really* a dialogue. The experimenter remains the Big Other in Pavlov's proto- totalitarian micro-state, and research animals can only perceive and respond. Their otherness becomes progressively erased. Although the production of saliva answers a question, both the posing of the question and the interpretation of saliva as an 'answer' is done exclusively by the experimenters. For Lacan, the Turing test is the ability to lie and deceive, and animals (as involuntary producers of gastric juice or drool) are unable to do so, for to lie and deceive requires that language is in place (Lacan 1962-1963/2004: 78).

In other words, Pavlov's experiments represent a boundary situation. Posing and answering questions (including the ability to lie and deceive, for instance by fabricating research results) remains a privilege of speaking subjects. This also explains why human beings (after a certain age) will no longer be helped by offering them a bottle with a plastic nipple to satisfy their oral desire. The conditioned reflex revolves around a basic need, which can be satisfied in principle, but when it comes to human desire, humans will rather order a particular brand of yoghurt, wine or whiskey, marked by a particular label: a substitute, psychoanalytically speaking, for something which is irretrievably lost (the oral object *a*).

In short, conditioning is the establishment of a signifier: the rudimentary beginning of symbolic communication. It introduces a third (triadic, symbolical) term into the dual stimulus-response mechanism. Thus, humans may train and communicate with animals under domestication (Lacan 1957-1958/1998: 339) and there is a connection between conditioning and detention (i.e. dependence). We do not communicate with animals in the wild. The signifier intervenes in the metabolic and behavioural cycles of domesticated animals. Sounds and signals employed to stimulate trained animals are signifiers, and the laboratory is an environment of signifiers, but the signal remains an isolated third term, only valid in the context of the interaction between researcher and research animal. Therefore, this type of communication differs from speaking a language. What is missing, as Lacan phrases it, is concatenation (ibid.: 340): the linking together of various signifiers into series or networks. In Pavlov's laboratory, signifiers remain arbitrary segments and do not follow any rules or laws. There is no symbolic order beyond the Pavlovian signifier. For humans (for the experimental researchers) the laboratory as a topological ambiance, a typographical space, a cultural environment replete with symbols (letters, acronyms, numbers, clocks, exit signs, etc.), but this typographical arena only exists for the researchers involved. For the animals, only particular elements become meaningful.

Saliva is the object *a*, the object of desire, but exclusively for the researchers. Its absence and presence confirms or undermines a theoretical expectation, a hypothesis, something which emerges in a network of signifiers. Saliva is something to be desired, not because of smell or taste of course, but precisely because it can be taken out of circulation (with the help of a fistula, a tube, a petri dish). It can be collected, quantified, and analysed, and eventually sublated into quantified input for equations, publications and citations (assuming academic market value). In other words, although researchers exist in a physical environment (they need food, oxygen, light, etc.), they dwell in a symbolical ambiance as well.

And while food is something physical and metabolic, an 'academic ration' of food (single or double: depending on the Bolshevik authorities) is something which belongs to the symbolic order. Conditioning implies that research animals enter the symbolic realm, but in a rudimentary way, namely via a limited set of signifiers, signifying the presence or advent of a human other.



### Experimental neurosis as unintended by-product (§)

As a rule, one of the unintended by-products of experimental research with animals is animal suffering and the moral dilemmas raised by this (Ryder 1975; Dol et al 1999; Zwart 2016). Although on paper Pavlov's research practice is presented as animal-friendly, in actual practice this was not always the case. Many of his experiments involved suffering on the part of animals (Todes 2000; 2002) and countless frustrations on the part of the researchers, employed by Pavlov to conduct the actual research: his research assistants, the work force of his physiology factory (Todes 2014: 147 ff.), known as 'praktikanty' (medical students and young physicians eager to acquire scientific experience to advance their careers).<sup>6</sup> Both humans and dogs were regarded as co-workers (Todes 2014: 494). As Haraway (2008) argues, besides research assistance and animal caretakers, also the research animals themselves should be taken seriously as 'workers in the lab' (Haraway 2008: 71-3), people and dogs are workers, producing knowledge under strained conditions in ongoing interactions, and also the suffering is mutual.

Animal suffering is often framed as a 'necessary evil', in other words, as an unintended by-product, causing professional malaise (§ in the lower-right position), perhaps even turning laboratory research with animals into an 'impossible profession' (Zwart 2016). Indeed, in the course of history, several prominent pioneer experimentalists such as Albrecht von Haller (1707-1777) and Johannes Peter Müller (1801-1858) were tormented by feelings of guilt and despair because of the animal suffering that was caused by their research, to such an extent even that they became 'victims of science' (Ryder 1975) themselves. They either decided to leave the field (like Von Haller, who turned to poetry and alpine botany) or committed suicide, as in the case of Müller (§ in the lower-right position: moral suffering as unintended by-product of animal research).

Pavlov addressed the moral dilemmas inherent in animal research by developing a unique experimental method, which he referred to as the 'chronic' or 'surgical' method, contrasting it with the 'acute method' that was employed by the 'champion of vivisection' Claude Bernard (Zwart 2008: 101). While Bernard's dogs were severely damaged and usually died during or shortly after the experiment, Pavlov allowed his dogs to recover after being operated upon.

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<sup>6</sup> Pavlov had been nominated for the Nobel Prize in 1901, 1902, and 1903, but each time the committee struggled with the question to what extent the products of Pavlov's laboratory were truly Pavlov's (Zwart 2010). He designed most of the trials, presenting the results in books, papers and lectures, but the actual experiments were conducted by *praktikanty*. The output seemed a 'compilation' of their dissertations (Todes 2002: xiii). In 1904, the prize finally was awarded.

Indeed, interest in the health and well-being of his experimental dogs was an inherent part of his approach. Pavlov argued that only normal and healthy dogs could provide a reliable model for research. He interfered as little as possible with the animal's normal functioning (Wells 1956: 18) and trained his experimental dogs to lie calmly on the operating table to undergo all the manipulations of elaborate experiments, incising the skin and surface tissues, disclosing arteries and connecting them with instruments for registering blood pressure, and similar procedures (Wells 1956: 17). Pavlov claimed that his animals fully recovered from such operations, if well cared for (1955: 95). He saw his dogs as active participants in the experiments, thus contributing to the success of his research (Todes 2000: 52; Todes 2014: 149). As Pavlov phrases it:

Our healthy and happy animals did their laboratory work with real gusto; they always rushed from their cages to the laboratory and readily jumped on the tables where our experiments and observations were conducted. Believe me; I am not exaggerating one iota. Thanks to our surgical method in physiology we can demonstrate [the phenomena of digestion] without a single scream from the animal undergoing the experiment.

Pavlov 1955: 132

Pavlov devised ingenious and delicate operations to make the normal internal functioning of organs accessible for continuous observation, while impairing the organism as little as possible. In order to obtain gastric juice from a dog during an extended period of time, an artificial miniature stomach was produced, but Pavlov assures his readers that 'this operation does not cause any serious discomfort to the animal and does not endanger his life' (1955: 98). Dogs were subjected to the most advanced surgical techniques that were also applied to humans<sup>7</sup>, in order to allow them to fully return to post-operative normalcy:

I regard the promotion of our surgical technique to be a matter of greatest importance, because the usual method of simply vivisectioning the animal in an acute experiment is ... a major source of error, since the act of crude violation of the organism is accompanied by a mass of inhibitory influences on the functions of the different organs.

Pavlov 1955: 101

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<sup>7</sup> 'The desire ... to spare our experimental animals as much as possible made us strictly observe all the precautions taken by surgeons in respect to their patients' (Pavlov 1955: 132); 'Pavlov's dogs were operated upon and cared for almost as if they were human patients in a good hospital' (Todes 2000: 51).

Whereas his collaborators often remain anonymous (humans without a face), some of his dogs acquire a distinctive identity of their own, notably Druzhok, Pavlov's favourite research animal (his 'best friend'). For each dog a notebook was compiled (Todes 2014: 494). Yet, although Pavlov took great pains to cultivate the image of normal and happy laboratory dogs, the reality was often somewhat different (Todes 2002: 98). Many dogs died and survivors would often develop chronic health problems or even fatal conditions, and even Druzhok became ill.

In his comments, Lacan focusses on the *psychic* rather than on the physical suffering of Pavlov's experimental dogs. After 1900, as we have seen, Pavlov's focus of research shifted from physiology to psychology: from the animal's metabolism to the experimental *rapport* between researchers and animals. As a consequence, the researcher-animal relationship became increasingly formalised. The basic component to work on was no longer an elementary physiological function. Rather, a basic need (e.g. hunger) became the starting point for a sequence of events. The pre-1900 surgical cut (producing a fistula or miniature stomach) interrupted a physiological circuit, but post-1900 interventions invoked a cut in the psychic structure of the basic need, allowing researchers to reengineer behaviour. With ample financial support provided by the communist authorities as we have seen, Pavlov designed a new type of laboratory: the 'towers of silence', affording 'maximum control over the environment of animals' (Todes 2002: 349). In these facilities, the friendly interactions between researchers and animals gave way to a radical simplification of the ambiance (Pavlov 1955: 192), so that a maximum of control over the smallest behavioural details could be achieved (Todes 2000: 78). Animals no longer acted as participants in, but as amply documented targets of research.

In the context of this shift, Pavlov noticed 'experimental neurosis' in some of his dogs as a by-product of his approach. In a famous study conducted by Nadeshda Shenger-Krestovnikova (one of his collaborators in 1926), a conditioned alimentary reflex (an excitatory salivary response) was established in a dog (named Vampire) with the help of a circle of light projected on a screen placed in front of the animal (Pavlov 1955: 235). The circle thus became a conditioned excitatory stimulus (CS+), capable of eliciting salivation. Subsequently, a differentiation of the circle from an ellipse was obtained. While the image of the circle was accompanied by feeding, the image of the ellipse was not. In this way, differentiation was achieved and the ellipse became a conditioned inhibitory stimulus (CS-), predicting the absence of food. Whereas the circle evoked an alimentary reaction, the ellipse inhibited the response through conditioning. Initially, however, the ellipse significantly differed from the

circle (the proportion of the axes being 2:1). Subsequently, the form of the ellipse increasingly began to resemble a circle. The axes of the ellipse were gradually equalized, so that the researchers were able to obtain ‘an increasingly delicate differentiation’ (ibid.: 235). When the ratio of the axes reached the value of 9:8, however, the dog (who previously behaved quietly in the stand) began to move about and whine, and became increasingly excited. As discrimination became increasingly difficult, the dog’s behaviour became increasingly disorganized. And after 3 weeks had elapsed, the dog was unable to respond correctly to this task, even if the stimuli were obvious circles or ellipses. The ability to discriminate progressively worsened and finally disappeared altogether, and the dog showed extreme levels of excitement when confronted with stimuli of this type, howling, and struggling in his apparatus, running in circles, barking for no apparent reason and drooling copiously. Apparently, the task had been ‘overstressing’ (Todes 2014: 501) for the dog, and the animal now showed all the symptoms of an ‘acute neurosis’, due to a collision between excitatory and inhibitory processes (Wolpe 1996). Pavlov had apparently read (or read about) Breuer and Freud’s case history Anna O and was struck by the analogy between the disorganised behaviour of the dog and the situation of Anna O (Windholz 1990: 49; Gray 1979; Todes 2014: 499). Both seemed caught between two contradictory impulses – excitation coming from the circle and inhibition induced by the ellipse.

To some extent, Lacan agrees with this. The implementation of a signifier (as an artificial third term) disturbs the normal behavioural circuit and, in case of conflict, may unleash a rudimentary ‘neurotic response’ in experimental dogs. According to Lacan, Pavlov’s experimental practice resulted in animal ‘neurosis’ (Lacan 1966: 273, p. 460) because the animals became increasingly dependent on and frustrated by the manipulations by the researchers (as by-product of experimental research, lower-right position). At the same time, Lacan emphasises that this neurosis (produced in dogs) differs from the suffering of neurotic patients (in psychoanalytic treatment). Whereas in animals neurotic suffering is connected to the experimental situation, human neurotics are haunted by language as such, by the labyrinthine symbolic order as such. In Pavlov’s dogs, neurosis is a laboratory artefact, produced by researchers who try to force dogs to differentiate between circles and ellipses, but neurotic patients are tormented by (and hypersensitive to) the voice of conscience. They are paralysed by an unspeakable sense of guilt.

From a behaviourist perspective, even human neurosis may be regarded as a misguided and dysfunctional conditioned response no doubt, an ill-adapted yet learned behaviour, something

which behaviour therapy may try to undo and reset via therapeutic techniques such as counterconditioning or habituation, but the goal of psychoanalysis is a different one. For psychoanalysis, the question is not how to reengineer the human psyche. Psychoanalysis is not a human science, not a mental orthopaedics (Lacan 1953-1954/1975: 208), but develops a different type of discourse: the discourse of the analyst. For psychoanalysis, the question is not why dogs salivate, but why researchers such as Pavlov develop an interest in saliva in the first place. What forces these *praktikanty* to spend so many person-hours collecting and analysing bodily fluids? From a psychoanalytic viewpoint, Pavlov and his co-workers become a case history, rather than his dogs. At a certain point (more or less at the time when Freud published his *Interpretation of Dreams*, Pavlov discerned how a sample of saliva (produced in response to a sound) could open up a new arena of research. Somehow, this ‘rang a bell’. Pavlov’s genius was to realise that the presence or absence of saliva could serve as starting point of twentieth-century practices of knowledge and power.

The discourse of the analyst which we have now entered, however, differs from university discourse and entails another anti-clockwise quarter turn of the quadruped scheme, so that the focus of attention shifts. The question is not how dogs can be trained to salivate, but rather why these bodily fluids, produced by certain organs (partial objects) of research animals, and collected *in vitro* via artificial openings in the animals’ bodies, function as the object *a*, as the researchers’ object of desire. In other words, the attention shifts from saliva as such to the dialectical interactions between desperate researchers (driven by a desire to know and eager to acquire publishable results) and certain bodily secretions (by which they are fascinated or even obsessed):

<i>a</i> (secretions collected <i>in vitro</i> )	$\$$ (the desperate subject of science)
$S_2$ (mainstream knowledge)	$S_1$ (the political ideological truth)

The researchers now take the floor as desiring, tormented subjects, *interested* rather than *disinterested*, and spurred into action by their object of desire: the dog’s saliva that (if produced in sufficient quantities) may provide access to a medical career. For indeed, it is by subjecting dogs to experimental trials that they themselves hope to pass the test and receive their doctorate. Their interaction is facilitated by laboratory equipment and concurs with what Lacan refers to as the matheme of desire ( $\$ \diamond a$ ), where  $\$$  refers to the *interested* researcher,  $\diamond$  to

laboratory contrivances (experimental props) and *a* to something enigmatic, transient and inexorable, a waste product which suddenly becomes highly valuable, in this case: gastric juice or drool, collected in a tube or dish. Around 1900, as we have seen, Pavlov recognised the importance of his observation that gastric and oral secretions were produced in response to apparently arbitrary signals. Pavlov halted his physiological research ( $S_2$  is pushed into the lower-left position), because the saliva spoke out to him as it were: collect me, measure me! It was a disruptive experience ( $\$$ ), forcing him to drastically reconsider his research. The saliva unleashed an epistemological rupture and created a cut in his research program, an opening which provided access to the logic of social engineering: the key philosopheme of the human sciences of the twentieth century. His techniques, his experimental know-how, became building blocks of the ideology of social engineering (represented by the communist leadership): an unintended by-product of his research ( $S_1$  now in the lower-right position). Thus, saliva eventually fuelled the program of social engineering, of the engineering of souls: the ideological credo of both communism and Americanism.

#### **Final comments: perverse incentives and the intrusion of the real**

Pavlov's research facility functioned as a scaffold enabling the instalment of a signifier through classical conditioning. And this gave rise to the emergence of a rudimentary symbolic order. But such a set-up remains vulnerable to the intrusion of the real: the return of the repressed (i.e. the unconditioned, wildtype response) in the Real. Pavlov explains how, under the action of 'extraordinary, directly inhibiting stimuli', as he phrased it, a chronic predominance of inhibition took place (Pavlov 1955: 238), due to a disruptive event which struck Pavlov's laboratory on 23 September 1924. During a dramatic flooding of the river Neva, his dogs almost drowned in their cages and were forced to swim to the top of their cells, until they could be rescued with great difficulty. The carefully produced conditioned reflexes disappeared and although the dogs were expected to resume their work routine, this proved difficult in some of them. Two dogs in particular failed to salivate in response to any of the established CSs (Todes 2014: 504). For a considerable period after rehabilitation, their responses suffered from a sudden surge of inhibition and their carefully established conditioned reflexes seemed irretrievably deranged. Their normal environment had worked as a scaffold supporting their learned behaviour, revolving around the emergence and disappearance of signals, but now they experienced regression and were thrown back onto their primordial reflexes. Laboratories are artificial worlds designed to keep the chaotic complexities of the outside world at bay, and from a Lacanian point of view, the flooding of the River Neva acted as an intrusion of the Real (Zwart 2017b).

For Lacan, this again points to the fact that, for research animals, the set of signifiers, established in series of experiments, remains fragile, and may be erased in the case of trauma. Whereas human beings inevitably dwell in a world of symbols and language, for dogs such symbolic connections have to be actively established and reinforced. Experimental neurosis reflects the suffering of research animals as a result of manipulations on the part of the researchers, but human neurotics suffer from the tyranny of the symbolic order as such. Both animal and human neurotics experience dependence, thralldom even, but while experimental dogs (spending their lives in confinement) are completely dependent on the actions of a particular experimenter, human neurotics are haunted by the linguistic and typographic ambiance as such, by an unspeakable and paralysing sense of guilt. In other words, while animals are pestered by experimental researchers, who expose them to projections of circles and ellipses for instance, the researchers themselves are spurred on by the academic voice of conscience – ‘go on, produce more knowledge, never enough!’ (Lacan 1969-1970/1991: 120-21) – and driven by a host of signifiers such as graduation requirements, food rations and Nobel Prizes. In the current era, performance indicators, citation indexes, h-scores and funding IDs play a similar role. Such symbolic entities may easily evolve into perverse incentives, giving rise to a collective academic neurosis and perhaps even result in an obsessive managerial pandemic. In the human condition, such phenomena tend to transcend local interactions between (sloppy or committed) researchers and their (stern or benevolent) research managers.

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