This is a pre-print of Candea M. 2013. Objects made out of action, in P. Harvey, Casella E.C., Evans G., Knox H., McLean C., Silva E.B., Thoburn N. & Woodward K. (ed.) *Objects and Materials Companion*: London: Routledge.

Objects made out of action

Debates around 'the agency of objects' have occupied the humanities and social sciences for some time now. This chapter, by contrast, raises the symmetrical question of the objectivity of action. My focus will be on 'behaviour' – action itself taken as an object. The concrete setting for this discussion is an ongoing ethnographic study of the world of behavioural ecology, and specifically of one research site in the South African desert called the Kalahari Meerkat Project. More specifically still, I will be examining one particular technical object – a handheld computer – which is used in data collection at this site, and which, I will argue, is centrally involved in the way behavior emerges as a scientific object.

This talk of 'emerging' is intentionally ambiguous – I am attempting, for now, to leave open three different types of explanations of the 'object-like' qualities of behaviour which are currently in play in the literature. One of these is ideally exemplified in the arguments of sociologist of science Eileen Crist. Crist's detailed study of the changing discourses of the science of animal behaviour, has described a process of 'epistemological objectification', in which a new technical language was forged which avoided treating animals as subjects with a meaningful world of their own (Crist, 1999). For Crist, this shift emerges with particular starkness in the contrast between the observational techniques of traditional naturalists and those of post-1970 behavioural biologists informed by sociobiological theories. The former, Crist argues, operated in a personalised knowledge-economy premised on an intersubjective engagement with the meaningful lived world of the animal – they gave animal actions a 'face'. By contrast, the latter base objectivity on the identification of detached and generalisable units of behaviour which multiple external observers can agree upon without any reference to the animal's perspective or subjective state (ibid, 146). Crist sees the prototype of the contemporary notion of behaviour in Descartes' concept of animal 'motion caused from pure corporeality', which the philosopher strove to distinguish from specifically human motion caused by the 'incorporeal mind' or 'thinking substance' (Descartes 1970 in Crist 1999:212-213). From this original distinction, Crist claims, derives the later elaboration of a split between (mere animal) behaviour and (human, intentional, meaningful) action which has become a commonplace in much social and behavioural science.

The second type of explanation of the object-like qualities of behaviour is well exemplified by behavioural biologist Marian Stamp Dawkins' reflection on the problem of identifying units of behaviour:

'At first sight, behaviour appears to have no building blocks, no equivalent of the cells and organs that build up a physical body. Nor does it appear to have units that can be measured like units of heat or light or length. It appears to be ephemeral, elusive, and constantly shifting, a will-o'-the wisp that defies definition. But if you look for a while longer, you will see that not only does it have units of its own, those units can also be measured and quantified.' (Dawkins, 2007:73)

Dawkins' solution to the problem relies on a two-fold regularity (see 2009:73-74). There is first of all a regularity in the animals' own activity: of all the physiologically possible combinations of animals' movements, a 'restricted subset' of patterns nevertheless emerges (animals chew before swallowing, build the foundations of their nests before they build the sides, etc.). Far from giving such patterns a 'face', or seeing in them evidence of intentionality, however, Dawkins takes a different tack, in which the regularity of animals' patterned behaviour echoes directly with the regularity of the ways in which different observers can recognise the same patterns. This regularity of recognition (in the sense, now, of pattern-matching) in turn is the effect of an objective property of observers themselves: ' "the computer in the head" (their own brain)' (ibid:74). Dawkins' own exposition relies explicitly on intersubjectivity (between observers, and between author and reader) as evidence of a direct communication of objectivities: 'You know exactly what I mean by 'pecking' or 'flying' because your brain will have picked out these common and highly distinctive behaviour patterns itself' (ibid). For Dawkins, (the unit of) behaviour's objective reality is thus sealed *both* 'out there' in the regularity with which animals behave, *and* 'in here' in the regularity with which different observers, or rather 'the computer in their heads', behave in picking out the same pattern.

In sum, Crist locates behaviour firmly in the realm of human language and epistemology: 'behaviour' is a conceptual object historically excised by philosophers and scientists from the flow of life. By contrast, Dawkins locates behaviour just as firmly in the realm of animal biology (including the biology of the animals that the observers themselves are).

To these two locations of the object-ness of behaviour (in human epistemology, in animal biology), an influential tradition in science studies urges us to add a third: the equipment and apparatuses with the help of which researchers frame and stabilise their encounters with the animals they study. Bruno Latour, for instance, describes the way in which the material equipment, as well as the concepts, deployed by human primatologists lend solidity to the fluid social practices of non-human primates (Latour 1996: np; Strum & Latour 1987:791). In a related vein, Donna Haraway points towards the mutual implication of "people, organisms and apparatuses" which gives behaviour its object-like quality:

'A behavior is not something just out there in the world waiting for discovery; a behavior is an inventive construction, a generative fact-fiction, put together by an intra-acting crowd of players that include people, organisms, and apparatuses all coming together in the history of animal psychology. From the flow of bodies moving in time, bits are carved out and solicited to become more or less frequent as part of building other patterns of motion through time. A behaviour is a natural-technical entity that travels from the lab to the agility training session.' (Haraway 2008:211; see also 1989).

The objectivity of behaviour, in this vein, is an outcome of a particular, successful, networking of humans and non-humans.

This chapter starts from this now canonical material-semiotic approach in science studies, in which attention is shifted away both from 'ideas' and from 'nature', towards the primacy of material arrangements in concrete research settings (Rheinberger 1997; Latour 1987). I will focus on particular piece of kit, a Psion handheld computer which accompanies researchers at the Kalahari Meerkat Project as they collect observational data about meerkat behaviour. The Psion could be seen as a classic instance of what Rheinberger would term a 'technical object', one of the stable, predictable elements of the 'experimental system' which enables enquiry into, but simultaneously constrains and restricts, the 'scientific object' under investigation: animal behaviour itself (Rheinberger 1997:28-29).

However, the aim of this account is not merely to provide (yet) an(other) exemplification of this approach, but also to raise a few partial challenges to some of its implications. In particular, I will suggest in the following that our concerns with what things can do may risk begging the question of what it means for doing itself to be thing-like.

Introducing the Psion

This is a pre-print of Candea M. 2013. Objects made out of action, in P. Harvey, Casella E.C., Evans G., Knox H., McLean C., Silva E.B., Thoburn N. & Woodward K. (ed.) *Objects and Materials Companion*: London: Routledge.

Set up in the early 1990s, the Kalahari Meerkat Project is a meticulously organised assemblage of humans, technical objects, and animals, which have managed the following impressive feat: in its first 15 years of existence, the KMP had collected around 2.5 million behaviours. Although the ostensible achievements of this project are more often measured in terms of high-profile papers in scientific journals, the sheer amount and detail of data collected is impressive in its own right. These behaviours, each precisely dated and timed, are each associated to one of hundreds of named individual meerkats whose weight, parentage, life-history and present and past social position within its group is carefully and continuously documented by a rolling team of 15 or so volunteer observers, each of whom spends a year living in this remote field-site. If a field-site is a particular kind of 'scientific instrument' that answers questions about behaviour (Rees, 2009), then the KMP is an extremely well-tuned and successful such instrument, or, in Rheinberger's terms 'experimental system' (1997), which has enabled scientists working there to publish a raft of high-profile articles.

But how does the system work? How is the numerical feat described above actually achieved, and crucially, maintained through time? The answer would require an exhaustive description of processes of research at the KMP, but also of the history of successful funding applications and other economic-epistemic alliances (with television producers, film-makers and the charity Earthwatch international for instance), which have enabled the project to endure. Such an account is beyond the scope of this chapter, although I have begun to tell aspects of this story elsewhere (Candea, 2010). My aim here is more modestly to start from one particular object.

Observers at the KMP make use of a handheld computer about the size and shape of a 1990s Nintendo 'game boy', which they refer to by its brand name as 'the Psion'. In the backpack which each of the volunteers pack every morning before they set off to observe a group of meerkats, the Psion jostles alongside a motley collection of other objects: a walkie-talkie, a radio, a plastic tupperware box containing electronic scales carefully wrapped up in bubble wrap, a GPS device, a paper journal with a pen firmly attached with string and duck-tape, some boiled egg in a plastic bag, a water bottle fitted with a long, thin drinking spout of the kind one might find attached to the side of a hamster's cage. Each of these objects participates in its own way to the growing collection of carefully indexed and solidly black-boxed behaviours, each has its own story and deploys its own possibilities and limitations. But let us focus on the Psion.

The Psion is quite heavy, a thick wodge of grey plastic which might seem just about indestructible to those who are used to more recent, slender machines - machines that are all screen and no buttons. The Psion plays it quite the other way: it has a small LCD screen which will carry two lines of alphanumeric characters in dark grey on a light grey background, but is covered in buttons, providing a full keyboard for the thumbs. A solid plastic cover slides over the keys to protect them when the Psion sits in the bottom of the rucksack. A flap at the back reveals a slot for a good plain rectangular battery, the kind with two connectors on top which, in my school at least, we used to dare each other to lick in the margins of science classes. And yet, despite its sturdy appearance, the Psion is intensively fretted over by volunteers. This is partly because many of these Psions are old and tired, having been deployed in the daily grind of field science in desert conditions for many years. Hinges don't always hinge and slides don't always slide as smoothly as they used to. Duck-tape holds cracked plastic and loose battery cover together. But mostly, extra care has to be taken with the Psions because they are now technological orphans, disconnected from a once thriving life-support system.

Indeed, if we trace the KMP's 'Psions' beyond the field-site, they turn out to have a pretty exciting biography under the name Psion Organizer II. Although the Organizer II's makers, Psion Ltd., have now decidedly moved on and make no mention of the device on their website[1], the machine has left other trails online, on the websites and wiki entries of enthusiasts. Zigzagging through broken links and long-defunct domain names, one occasionally comes across whole user manuals, lists of technical specifications painstakingly typed up, and a live forum with 600 members[2]. Practical patches, ideas for tinkering with hardware and software, solutions to technical problems, jostle with unattributed statements, undocumented facts and sad admissions of failure, floating on the web like messages in a bottle ('This Psion Organiser II web site is closed. [...] I have asked for help from others but the continuation of this site in its current format has always been an issue. [...] So it is with great sadness that I am calling it a day.'[3]). But most of all, shining quite touchingly through these fragmentary trails is the love that is still out there for 'the grandfather of all handhelds', in the words of one forum contributor[4].

The Organizer II, it seems, was first produced by Psion Ltd. in 1986 as a versatile portable computer. It had a basic operating system and a number of in-built applications which allowed it to be used as a diary or an alarm clock. Crucially, the Organizer II enabled users to create their own simple programs using Psion's own 'Organiser Programming Language'. It also had an external device slot which fitted a number of different hardware extensions, from a printer module to a 'comms-link' which allowed the Organizer II to talk to other devices via a RS-232 25-pin connector. Reportedly, over a million Organizer IIs were sold and used in a range of ways from retail through to government offices, from building sites through to scientific projects. It went out of production in the early 1990s and was replaced by a new range of clamshell devices. And yet, as a post from 2001 tells us, 'You'd be surprised how many of them still are doing their duty.'[5]. The Organiser Programming Language, now renamed Open Programming Language, lives on as an open-source project[6], and 'guerrilla' users have over the years created programmes which allow Organizer IIs to be used as pollen counters, holiday memory logs, maze games and bike computers[7]. In sum, the Organizer II is a survivor - cut off from its official support system, it continues to live a multiple precarious and inventive life through an adopted international not-quite-community of users.

The KMP's Psions, however, carry little of that sedimented and moving history, beyond a general sense that these superannuated machines need to be kept alive without outside support. Nor do they exhibit much of the versatility of which the web shows them to be capable. Neither diaries, alarm clocks, nor bike counters, and certainly not games-machines, the KMP Psions sturdily 'do their duty' in one single, predictable way dictated by a user-generated programme written in OPL, which was devised specifically for the project to collect behavioural data. The Psion enables the quick logging of observed behaviour in the following way: its program specifies a one letter code for each of the behaviours which volunteers are tasked to collect (many Psions at the project have a printed sheet of paper sellotaped to the underside of the plastic cover, which lists the behaviours and their associated codes). For each behaviour entered, the program prompts users to specify the individual or individuals involved, each themselves identified by a one-letter code. The Psion logs the time of each entry and produces a set of lines of code which are then transferred into the project's central database at the end of each field session via the comms-link port.

Self-control

The Psion could first of all be described as the nexus of a series of simplifications and constraints. It is itself simplified, its many potentialities constrained by the programme into one specific set of input-output relations. This simplification in turn relies on and enables a simplification of the meerkats' multifarious and complex lives into a series of lines of code. In this sense, the Psion is a materialisation of the principles of a particular sampling methodology articulated by behavioural biologists such as Jeanne Altman (1974; cf. Haraway 1989), and rehearsed in methodology manuals ever since (Lehner, 1996; Dawkins, 2007; Martin and Bateson, 2007): animal behaviour is disaggregated into units, each of which is precisely defined *ahead of* the observation, in order to enable inter-observer comparisons.

We have already seen Eileen Crist's analysis of this methodological shift as 'an intensification of the erasure of the [animal's] life-world' (Crist, 1999:149). Unsurprisingly, however, this is not how behavioural biologists themselves would describe the logic of the practice. A more ethnographic sense of what is in it for them, of the 'indigenous' logic and affect of these sampling practices can be garnered from the following striking observation by Marian Dawkins in her recent introduction to the methodology of observational studies of animal behaviour:

> '[e]ven if we cannot control our animals as precisely as an experimentalist would like us to, we can, as Schneirla (1950) and Altman (1974) put it, control ourselves' (Dawkins 2007:9).

Drawing on Daston and Galison's excellent history of the many forms of objectivity which have shaped the scientific self over the centuries, one recognises here the flavour of 'mechanical objectivity', in which the self that is being controlled is 'a projective self that overleap[s] its own boundaries, crossing the line between observer and observed' (Daston and Galison, 2007:257). The Psion is a materialisation and enabler of this self-control, constraining observers to record only those behaviours which the project has selected ahead of time as relevant. Unexpected behaviours, strange and exciting events and unknown individuals might well intrude into the observer's experience (and will of course be relayed back to the research station in the form of stories and accounts), but the Psion stops these from making it into the data proper.

The Psion thus constrains both the behaviour of humans and that of meerkats but, crucially, it does so in asymmetrical ways: it directly constrains the behaviour of human observers (what they are actually able to do), while it only constrains which aspects of those things the meerkats do get to count as behaviour in the database. In this respect, the Psion materialises an economy of knowledge which sets apart the constraints of observational field science from those of experimental laboratory science (Stengers, 2000:140-144; Despret, 1996). The laboratory maze or skinner box, to take two iconic examples, constrain the movements of rats or pigeons, subjecting them to a series of pre-defined choices: turn right, turn left, press this lever or that button. By contrast, the Psion is small and unobtrusive so as to stay out of the way of meerkats themselves, but it channels the observers through a series of 'if X, then Y' (if you want to describe a behaviour, then you must tell me which of these it is; if you have entered a behaviour, then you must tell me the individual involved; etc.). The Psion's effect on behaviour is intentionally asymmetrical: it aims to affect and channel the behaviour of human observers, without affecting that of meerkats. The Psion is, in other words, a maze for humans, rather than for meerkats.

Materialising knowledge

Equally, however, the Psion could be described not through what it constrains, but through what it enables – or rather, through what its constraints enable. To begin with the obvious, translating individuals and behaviours into one-letter codes greatly speeds up data entry. This, however takes work: each of the 200 or so meerkats studied at the project has a name (given by the volunteers themselves - cf. Candea 2010), as well as a unique 10-character number, enshrined in a chip the size of a grain of rice which is embedded in the scruff of its neck, and another unique alphanumeric code which specifies its group, sex and other information and by which it is known in the central database. Typing any of these into the Psion would drastically slow down the process, which is why the programme is configured to bind observation sessions to particular meerkat groups, within which meerkats carry a single one-letter code. The Psion then translates this one letter 'group-relative' code into the long 'population-relative' code by which individuals are known in the general database.

The value of such materially enabled simplifications (see Latour and Strum 1989) emerges if we begin to place data-entry within the process of observation as a whole. Taken literally, data-entry would be preceded by the following steps: recognising the behaviour, checking its one-letter code, noting the individual's 'dye-marks' (the coordinated pattern of spots which the researchers marked the meerkats in order to aid the recognition of individuals), relating the marks to the individual's contextual one-letter code with the help of the 'mark-sheet' (a small printout which details the names, codes and distinctive markings of each of the animals in the group), and then actually typing the data into the Psion. All of this, while keeping an eye on the 15 or so other meerkats foraging in different directions!

During my first few outings with the volunteers, I simply couldn't understand how they were able to juggle all of these different procedures, and how some nevertheless managed to bring back up to 100 lines of data from a single field-session. In time, however, I came to see that as volunteers became more experienced, they progressively converted this set of successive steps into the near-immediate process of 'seeing' the behaviour of known individuals: 'there's Ningaloo going on guard again'. Learning to do this was partly about translating a set of abstract or arbitrary codes into personal, situated knowledge. During one of my first outings, for instance, I mistakenly identified an individual as bearing the dye-mark 'tail-base tail'. The volunteer I was accompanying, without missing a beat, told me there was no such mark in this group and briefly looking up, correctly identified the marking as 'left thigh, tailbase'. To the unfamiliar observer, matching dye-marks to an individual could be very tricky (a thigh-mark or shoulder-mark for instance, could easily be hidden on the side opposite the observer) – not to mention the fact that the meerkats were constantly in motion, half buried as they dug for bugs, or weaving in and out of scrub. In familiar groups, however, volunteers had learnt to instantly recognise meerkats as named individuals, by a combination of physical characteristics and dye-marks, and had memorised their one-letter codes. Aside from reducing the number of steps between seeing things and entering data, this kind of personalized knowledge brought with it a lot of information about each individual's antecedents, place in the group, habits and idiosyncrasies.

The same process of personalisation of arbitrary codes applied to the behavioural units, for which volunteers had created a series of mnemotechnics on various levels of abstraction: C (guard up) for 'climb'; D (guard down) for 'down', E for grooming, because E looks like a comb; Q for pup-feeds, because Q looks like a bottle. Learning these meant one avoided the need to check the code for any but the most unusual behaviours. But it also lent an uncontroversial solidity and uniqueness to the behavioural units themselves, which were as self-evidently 'out there' and distinct from one another as the keys on the key-pad. One came to know and recognise behaviours as one knew and recognised the meerkats themselves. Volunteers became attuned to what was likely and unlikely to happen, to the regularities of meerkat behaviour. Seasoned volunteers were able to spot the incipient signs of a 'pup-feed' or a 'guard up' just as they became skilled at recognizing particular individuals from a glimpsed body part alone. These kinds of familiarity crossed over onto each other, of course: knowing the meerkats was partly knowing how each *tended to* behave.

The Psion, with its simplifications and constraints, was thus one of a broader collective of objects, techniques and organisms which enabled the production of knowledgeable observers, known individual animals, and plentiful data. Although I have focused mostly on the programme, the more obviously material qualities of the Psion were also an important factor here. As one volunteer pointed out, the clunky old-fashioned keypad had one distinct advantage over more recent touch-screen devices: it allowed experienced observers to touch-type lines of data without taking their eyes off the animals. In other words, the Psion both extended and constrained the abilities of the observers in specific embodied ways. It 'configured the users' (Woolgar, 1991) as skilled field-based observers, just as it configured the meerkats as entities which could behave in a certain number of pre-set ways. It itself was configured as a usable and practical machine for logging behaviour, not only by the programmers, but also by the observers who knew how to use it and by the meerkats who did, after all, mostly behave roughly as expected.

Conclusion: the objectivity of behaviour and the behaviour of objectivity

So, in conclusion, what does a closer look at the Psion add to the three approaches to behaviour with which this chapter began? To Crist's focus on epistemological objectification, it adds, first of all, a sense of the materiality of the processes by which the distinction between action and behaviour is pinned down in practice. Crist characterises objectivist accounts of behaviour as an ever-renewed and ultimately futile struggle against (the English) language's in-built propensity to attribute intention, and derives from this and other clues the lesson that the distinction between action and behaviour is "neither a natural classification, nor an inbuilt one" (1999:222). But in the meantime, countless repeated measurements and inscriptions, enabled by the stable equipment of contemporary field and laboratory science, have helped to solidify this distinction in no uncertain way. This is why, in my ethnographic experience, concerns about excluding the language of intention in the way researchers speak to each other or to a broader public, are little more than a side-show, devoid, for the researchers themselves, of the power to put in doubt that which the Psion and its kin show us to be objectively measurable. But the story of the Psion also adds a sense that the gulf is not so great as Crist's account occasionally implies, between 'personal knowledge' and the kind of knowledge which proceeds through abstracted, quantifiable units. Getting to know meerkats as individuals and getting to know behaviours goes hand in hand, and the Psion helps with both.

To Dawkins' account of behaviour as objective pattern-matching, this account adds the (eminently Latourian, and before him, 'Bachelardian'[8]) caveat that we need not only 'the computer in [the observers'] heads', but also the computer in their hands, to make sense of the solidity and objectivity of patterns of behaviour. This addition is not as trivial as it might first seem, since the Psion doesn't simply help to 'record' behaviour, but also teaches the eye to see it in a certain way. Volunteers at the meerkat project tune 'the computer in their heads' with the help of the computer in their hands, and the latter contributes something to the unequivocal solidity of the units of behaviour it is used to record. In Rheinberger's (1997) terminology, the Psion is one of the 'technical objects' which make up the 'experimental system' in which 'scientific objects' (the object of study, namely here meerkat behaviour), are embedded. Such technical objects, taken together "'contain" the scientific objects in the double sense of this expression: they embed them, and through that very embracement, they restrict and constrain them."(ibid. 29).

So far, however, the Psion merely yields yet another exemplification of a now canonical approach in science studies which involves "a shift of perspective from the actors' minds and interests to their objects of manipulation and desire" (Rheinberger 1997:1). But in what way if at all does my story add to or depart from this approach itself? Two things.

First, the constitutive asymmetry of the Psion raises an interesting albeit partial objection to an entrenched and ever-repeated lesson of this tradition in science studies – what one might term its central dogma – namely that of the identity of discovery and invention: the thought that facts are by definition (and indeed etymologically) made rather than found. The power of this argument has rested primarily on studies of laboratory science, whose active experimental set-up lends itself rather easily to such a reformulation, although it has also been extended to the context of field science, notably through Latour's notion of 'circulating references' (1999:24–79). By pointing to the myriad things and practices that carefully, step by step, help scientists translate the world out there into the statement on the page, Latour aims to close the purported gap between 'nature' and its 'representation' by scientists, *or rather*, to redistribute it into a myriad of tiny gaps, tiny translations rather than one massive and mysterious effort of 'correspondence'[9].

What the Psion reminds us of is not to forget this 'or rather': the fact that the gap has not been closed, but simply redistributed. For there is still a crucial difference between saying that reality and representation are unattainable end points of a process which is all made of the same continuous 'stuff ' (circulating reference, 'phenomenotechnique', etc.), and saying that a gap between reality and its representation inheres in every tiny step of that process. What does this have to do with the Psion? As I wrote above, its crucial value is as an instrument that carefully constrains the behaviour of the humans but not that of the meerkats. Or in other words, while the Psion directly constrains what the humans can do in the field, it only constrains which aspects of what the meerkats do comes to *count as* behaviour in the database. That crucial distinction, which speaks to the difference between observing and transforming behaviour, is where, in this case, the gap reemerges For all that this gap is small in physical size (fitting inside a Game-Boy-sized machine) this does not, pace Latour, make it any less of a metaphysical abyss.

More broadly, the Psion asks us to further unpack the overall description of behaviour as "an inventive construction, a generative fact-fiction, put together by an intra-acting crowd of players that include people, organisms, and apparatuses" (Haraway 2008:211). The psion does not entirely contradict this broad characterisation, but it does ask us to have a closer look at the constitutive asymmetries and non-relations at the heart of this process.

Second, and more broadly, the story of the Psion highlights the fact that the science of behaviour introduces a kind of short-circuit between what Rheinberger terms 'scientific object' and 'technical objects'. Behaviour is both what the scientific object is made of, and also what the experimental system largely consists of: humans and objects 'behaving' in consistent and predictable ways. 'Predictable' is the key term here. The tradition of science studies I am considering here has something of a tendency to background or 'redistribute' the predictability of behaviour. Thus, at times, Latour seems to argue that human and more broadly animal behaviour is inherently volatile and unpredictable, until it is stabilised and scaffolded by the 'steeliness' of objects (see for instance Latour 1996). As Maarten Derksen has pointed out, however, this rather strangely ignores the many ways in which people are able to act predictably, for instance, as scientific instruments (2010, see also Yarrow 2005)[10]. At other times, Latour and others writing in this vein, characterise the object precisely as that which 'objects', that which resists in some way, is refractory to complete stabilisation, to complete 'black-boxing'. Objects are nebulous, fascinating, elusive entities which live in a kind of ontological *demi-monde*, between full, settled reality and complete inexistence (Daston 2000), and which vigorously push back against poorly conceived enquiry, thereby putting subjects to the test (Stengers 2000). This is why treating people (or animals) as objects, is – in this language – precisely about recognising their recalcitrance, their fascination, their ability to 'object' to our questions (Latour 2005:255; Despret 2005). If anything, it is *people* who are too predictable, too willing to 'behave', too easily made to conform to what scientists expect of them. Occasionally in these writings, the achievements of sociology, psychology or ethology in demonstrating the predictability of behaviour are re-described as impositions of the power of the experimenter on hapless subjects who are too bemused by the authority of science to resist in the way the objects of physics or chemistry resist the probing enquiries of their scientists (Latour, 2005, 2004; Stengers, 2010; Despret, 2002, 2004).

These authors' warnings about the need to ensure the objects of science really are able to 'object' express, albeit in a counterintuitive fashion, a concern which I trust many practicing scientists would also recognize. Nevertheless it would be problematic to conclude that predictable behavior is necessarily an effect of imposition. The constitutive asymmetry of the Psion's behaviour should once again give us pause in this respect: its aim is to (actively) enforce predictable behavior amongst observers, but only to (passively) pick out predictable behavior amongst meerkats[11]. That distinction suggests that the science of behaviour requires an account in which the active unpredictability of objects meets the objective predictability of actors.

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Notes

[1] www.Psion.com [accessed 4\9\11]
[2] http:\\forum.Psion2.org\YaBB.pl
[3] http:\\archive.Psion2.org\org2\org2dead.htm
[4] http:\\forum.Psion2.org\YaBB.pl?board=faq_general;action=display;num=100
[5] [http:\\forum.Psion2.org\YaBB.pl?board=faq_general;action=display;num=100
[6] http:\\web.archive.org\web\20081119150450\http:\\www.allaboutopl.com\wiki
[7] http:\\archive.Psion2.org\org2\links.htm; http:\\www.docsware.com\zschroff\Psion2\
[8] my account of the Psion could be read as a story about the 'phenomenotechnique' of behavioural units (Latour and Woolgar, 1979:64, following Bachelard (1953)), recasting those 2.5 million behaviours in the KMP's database as a reality "which takes on the appearance of a phenomenon by its construction through material techniques" (ibid).
[9] 'The immense abyss separating things and words can be found everywhere, distributed to many smaller gaps between the clods of earth and the cubes-cases-codes of the pedocomparator.' (ibid. 51). Like the pedocomparator (ibid 48–50), the Psion can be seen as one of those hydrid objects that helps translate world into word, the behaviour of meerkats into the 'behaviours/lines' in the database.
[10] "In all his texts on technology and society, Latour argues that social relations lack solidity and permanence without the cement of material technology. People are prey to unpredictable passions and whims; purely human bonds are soft. Without material tools, our society would be as volatile as that of baboons, who need to re-establish the social order each morning. "It is always 'things'– and I now mean this last word literally–which, in practice, lend their 'steely' quality to the hapless 'society'" (Latour 2005, 68). This claim ignores the extent to which the fickleness of people is the object of intense social scientific work, rather than being the uncontested, established fact that Latour (curiously, given his approach to facts) takes it for. The point of social science in the manipulative paradigm is to establish to what extent and under what circumstances human actions are predictable. The success of such research is often limited, but in general it contradicts the idea of unpredictability as a fundamental trait of people." (Derksen 2010:6).
[11] Of course, the Psion is only one part of a broader scientific set-up which also involves modifications of the meerkats' behavior, primarily through habituation (Candea 2010). Crucially, however, there too the researchers are concerned with isolating the aspects of the behaviour that they have modified from the ones they have not: but that is a different and more complex story (cf. Candea, Forthcoming).

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