

THINKING TECHNOLOGY AS A DISCIPLINE

by
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Beginning with a passage on technology in Heidegger's *Identity and Difference* (1969), this paper considers the possibility that 'Technology' could plausibly refer not only to worldly phenomena or topics of investigation (such as an ensemble of devices) but also to a possible discipline, on the model of 'Sociology', 'Psychology' or 'Biology' (section 1).¹ Continuing with the Heidegger passage, it goes on to consider some very basic parameters of such a discipline and its others – such as the 'Philosophy of technology' (section 2). The paper then turns to what might be one of the central debates in any such discipline: namely, how we can distinguish technological beings from their others (section 3). It concludes with a coda about why we need not necessarily limit Technology (as a discipline) to the study of merely human beings as technical things (section 4).

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In this paper I want to follow up and expand upon a fundamental principle of the emergent field of Cognitive Technology. At the outset of the project, its founders insisted that CT be taken as a new discipline involving an understanding of the human condition in a 'technological world' (Gorayska and Mey 1996; Gorayska and Marsh 1996). My premise is that this insistence would be considerably strengthened were the term 'Technology' itself – regardless of modifiers such as 'cognitive', 'information' or 'educational', and so forth – able to be used as the name of a discipline in its own right on the models of 'Psychology', 'Biology', 'Sociology' and the rest. And this as opposed to 'technology' being, for example, a mere name for a collection of tools or devices or, again for example, a name for externalisations of 'the mind' – some material things that are developed by (and, in their turn develop) the mind 'as a human characteristic'.²

At first blush, this may seem to be no more than a contortion of language. But, as with 'history' (a discipline or a simple synonym for 'the past'), many of the '-ologies' remain ambiguous. 'Psychology', for example, can be the name of a scholarly discipline, but it can also refer to what that discipline studies; for, at least in colloquial terms, we can refer to a person's psychology to indicate their characteristic

attitudes and so forth. Likewise, social problems are sometimes called 'sociological'; and the adjective 'biological' can qualify both 'science' and 'stains'. What I want to ponder here – bearing in mind that 'logos' is routinely translated as 'account' – are the consequences of the possibility that the same positive ambiguity could be extended to 'technology'. We know this word can have the latter type of reference in mundane contexts: some tools, devices, machines and the rest. Now the question is: what if the term were to shift across (along with other members of the broader family of '-ologies') to become the name of a distinct discipline?²³ And, moreover and more radically, what if it were to jettison its apparently necessary – but in fact, anthropocentric – association with the human(e), the humanities or the human sciences?

1.

In the second part of *Identity and Difference*, 'The Onto-Theological Constitution of Metaphysics', Heidegger remarks of 'what now *is*' – that is, of contemporary being as such and not merely of human being – in the following terms:

What now *is* is marked by the dominance of the active nature of modern technology. This dominance is already presenting itself in all areas of life, by various identifiable traits such as functionalization, systematic improvement, automation, bureaucratization, communications. Just as we call the idea of living things biology, just so the presentation and full articulation of all beings, dominated as they now are everywhere by the nature of the technical, may be called technology. The expression may serve as a term for the metaphysics of the atomic age. (Heidegger 1969:51-52)

Let us be clear as to what is at stake here: no more and no less than the possibility of a scientific or intellectual discipline – Technology – named as such. Its object would be a sector of beings, just as Biology happens to take living things as its object. Or rather, just as Biology is the *idea* of living things, so Technology might be the *idea* of 'all beings' in so far as they are 'dominated ... by the nature of the technical'. Right from the start, then, the possible discipline of

Technology may or may not be distinct from what is 'living'; let alone from the possible variety of the living world called 'the human'.

In her Introduction to this work, Joan Stambaugh (1969:13) goes further than Heidegger in one respect, and not as far in another, when she writes: 'Technology isn't just something man has acquired as an accessory. Right now [1957? 1969?] it is what he *is*'. This goes beyond Heidegger because it takes domination 'by the nature of the technical' to a more conclusive point: to one of identity between 'man' today and technology. Yet her paraphrase is also less complex and radical than Heidegger's own comments because it unduly confines the kinds of beings 'dominated ... by the nature of the technical' to those beings that happen to be 'men'. The difference is important because it shows up what Heidegger himself may have intended with regard to the question: of what should the discipline of Technology be the 'presentation and full articulation'? That is, in this passage from Heidegger, we are invited to imagine a form of thinking that would engage (that is, present and fully articulate) 'all beings', not just 'men'. In that respect, the hypothetical discipline of Technology would rightly include the study of plants and animals, inert 'nature' (rocks and clouds), artefacts (bombs and computers) as well as 'men'. In addition to this, and again by contrast with Stambaugh's formulation, Heidegger does not assume an identity between such technological beings and technology itself; rather he writes of 'domination ... by the nature of the technical'. To be dominated by something, that is, does not entail identity with it. If anything, it implies a distinct and crucial difference.

At least in the passage in question, while some will read Heidegger's reference to 'functionalization, systematic improvement, automation, bureaucratization, communications' as an objection to, or criticism of, the 'machine age', this need not be so. It is true that, elsewhere, Heidegger (1978a) is barely able to conceal a certain amount of what we would now call 'technophobia' when it comes to certain machines (such as the steam turbine) prevalent during his own lifetime. It is also true that, towards the end of his essay, he appears to rue the possibility that 'the rule of metaphysics may ... entrench itself, in the shape of modern technology with its developments rushing along boundlessly' (Heidegger 1969:72). Yet, in the originally cited passage, it is just as easy to read the reference to 'functionalization, systematic improvement, automation, bureaucra-

tization, communications' as no more than a list of 'identifiable traits' and therefore as among those characteristics of domination 'by the technical' that the discipline of Technology ought to present and fully articulate. That is, the passage can be consistently read without recourse to negative judgments about the 'morality' of technology.

One possible ambiguity does arise from this otherwise crystal clear passage, however. That is, when Heidegger refers to 'biology', he glosses this as 'the idea of living things'. Now we must ask: is he in fact talking about the discipline of Biology as such or merely to a particular type of beings? For if the latter, then, by his own analogy, 'Technology' may not be the name of a possible discipline either. (As we have seen, terms like 'biology', 'psychology', 'sociology', along with 'history' and 'chemistry', have an in-built ambiguity; each can refer to a particular discipline, or else to the sphere of beings that the respective discipline engages with). While this does not resolve the issue, it seems clear enough to me that, when Heidegger writes of biology as 'the idea of living things', he can at least be read as referring to forms of thought, if not only to formally constituted disciplines (such as one finds in university departments), and so perhaps to literally any thinking about what is that happens to be a living thing. So, even if he is not going so far as to gloss a fully-fledged discipline, he is not merely referring to a sphere of beings as such.

This suggests a reason for Heidegger separating 'technology' from 'the technical'. Technology is to be an idea about something (possibly including, as with Biology, professional, formally-constituted, 'disciplinary' ideas). And what it is to be an idea about is domination by (and not simple identity with) the technical. And how it is to be 'about' that is via a 'presentation and full articulation'. All of this is redolent of the kinds of rigour and training that one routinely associates with disciplinarity.

Nowhere in this specification – and this is important – does Heidegger say that the idea (including a possible discipline) of Technology should be critical of the technical, or of domination by the technical. Nor does he say that actual technologies, or indeed any technological being, including 'man', should be subjected to criticism. No principles are adumbrated here whereby, by comparison with those principles, the technological age, the 'atomic age', would be seen to fall short, to be inauthentic or just plain bad. And nowhere is there a mention of 'man' specifically, only of beings; let alone is

there a mention of some property of 'man' called 'humanity'. And so: there can be no mention in this passage of the peculiar idea that modern technology somehow negates, diminishes or otherwise works contrary to some intrinsic humanity. The inference we can draw from this is that any possible discipline of Technology is to be both descriptive and 'value free'.

In fact, evidence from elsewhere in Heidegger's work – especially including that on the crucial aspect of modernity he calls 'representation' and 'representationalism' – suggests that the very idea of an intrinsic or 'subjective' property called 'humanity' (that many today may think of as technology's 'victim') is historically contingent, contemporaneous as it is with modernity and representational thinking (Heidegger 1978b). To this extent, the very idea of a 'humanity' may be nothing more than a quite recent technology (or form of domination by the technical) in its own right. In this case, it too would be part of the 'presentation and full articulation' proper to the nascent discipline of Technology rather than the putative 'other' of technology.

At the end of the cited passage, however, Heidegger makes it clear that the idea of technology – albeit that it must now encompass more than just particular machines, tools and devices – is, even if it is to be a discipline, a metaphysics. In fact it is to be 'the metaphysics of the atomic age'. But again, this need not be read as a negative judgement. Almost all thought, for Heidegger, is either directly metaphysical or else imbricated in metaphysics. To say that a way of thinking or a discipline is metaphysical is, for Heidegger, simply to say that it confines itself to the merely ontic (the empirical sphere of actual beings) or to the merely ontological (the transcendental question of what it is to be in general), neglecting the critical difference between the two. Examples of the former would be Physics, Psychology and Economics; while the latter would be represented by the Western Philosophical tradition, Cosmology and all forms of mysticism. Either type of thinking, for Heidegger, is metaphysical since it is unable to think the crucial difference between the ontic and the ontological (which he calls 'the ontic-ontological difference').⁴ This difference, so unique to Heidegger's philosophical work, can take us (as we will shortly see) 'back out of metaphysics' and towards 'the essential nature of metaphysics'. Yet, as we have already seen, the domain of the idea of technology is, clearly, on Heidegger's account, the domain of 'all beings'. Technology-as-a-

discipline then is (or is projected as) a merely ontic metaphysics, no doubt about it, and is therefore quite different and distinct from any, and particularly from Heidegger's, Philosophical concerns.⁵ But in this respect it is on all fours with, for example, the Natural Sciences, Psychology or Engineering.

To repeat: the concerns of any discipline of Technology must be purely ontic-empirical. Heidegger's own project in this domain, however, is useful to us as a contrast. To see where Heidegger himself might go, what path he might take, given that he is far from interested in taking up (or doing) the ontic discipline of Technology himself – far from it! – we need to continue with the passage quoted at the start. It reads:

Viewed from the present and drawn from our insight into the present, the step back out of metaphysics into the essential nature of metaphysics is the step out of technology and technological description and interpretation of the age, into the essence of modern technology which is still to be thought. (Heidegger 1969: 52)

What this opens up is another area of investigation altogether: no longer Technology as an ontically-constituted metaphysics but rather, now, a Philosophical inquiry into the essence (Wesen) of technology – an essence which, as we know from Heidegger's famous dictum, is nothing technological. And while his earlier essay 'The Question Concerning Technology' (1978a) had made some inroads into this kind of inquiry into technology's essence, Heidegger now appears to think that this project is far from complete. Its details need not concern us here since we are now only interested in a purely ontic (that is, empirico-descriptive) proto-discipline of Technology; but it does signal the possibility of an important Philosophy of technology from which any such proto-discipline might take its bearings, albeit contrastively. In particular, such an inquiry may well furnish us with necessary and important insights into what the phrase 'the nature of the technical' might mean.

As far as this 'nature' is concerned, one clue in particular arises in the earlier essay 'The Question Concerning Technology'. There Heidegger writes of technology as such, as opposed to particular technologies (and, in particular, as opposed to those of the 'atomic age'): '[t]echnology comes to presence [west] in the realm where

revealing and unconcealment take place, where alétheia, truth, happens' (1978a:13). This arises from a closer etymological attention to the Ancient Greek word techné, a term more akin to our word 'art' and taking in all craft, handiwork and, just conceivably, the general equipmentality that Heidegger finds so critical to his existential analysis of Dasein's ordinary everydayness in *Being and Time* (1962).⁶ In this light, it is possible to see that our supposed contemporary domination by 'the nature of the technical' is but an inflection (whether fortunate or unfortunate does not matter here) of a much more general condition – one in which whatever is is effected by techné-equipmentality (by the ready-to-hand-ness of Dasein) as such, including such things as 'nature' (the stuff of the sciences), 'culture' and 'art'.⁷

2.

Later in 'The Onto-Theo-Logical Constitution of Metaphysics', Heidegger differentiates and relates the thinking of beings (including, presumably that of those beings dominated by 'the nature of the technical' he has already mentioned) from/to Being as such, in the following way:

how can 'Being' ever come to present itself as 'thought'? How else than by the fact that Being is previously marked as ground, while thinking – since it belongs together with Being – gathers itself toward Being as its ground, in the manner of giving ground and accounting for the ground. (Heidegger 1969:57)⁸

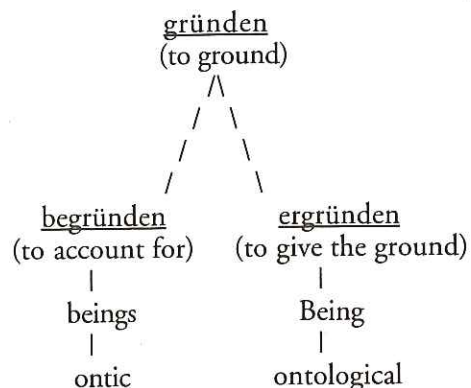
We need to remember, in this context, that Heidegger is describing a standard metaphysical procedure. This passage, that is, is not part of the 'step back out of metaphysics' which we have just now encountered and put to one side. He is dealing, rather, with a problematic tendency in all metaphysics to equate Being with thought (and so, perhaps, with what we now call 'the cognitive'). Accordingly, we have here a succinct account of what may be *the* metaphysical picture in general. Now since the discipline of Technology, as we have seen – if it is to exist at all – must be an empirico-ontic metaphysics, this connection of thought and being may give us a clue to at least one of the ways to begin to construct

such a discipline. That is, it may help us to see what the ontic (empirico-descriptive) disciplines might look like generally.

To help us in this project, Stambaugh offers the following important clarification of the terminology used here:

There are three closely related terms in the German text: 'begründen' (to account for), 'ergründen' (to give the ground), and 'gründen' (to ground). In a consultation Heidegger clarified the relation of these terms as follows: 'Begründen' has to do with beings and is ontic. 'Ergründen' belongs to Being and is ontological. 'Gründen' is the relationship of 'begründen' and 'ergründen' and encompasses both. (Heidegger 1969:57)

Diagrammatically:



So, if Technology is to be primarily, and limited to being, an ontically-involved (that is, empirical) discipline, then it becomes clear that one name for its central topic would be 'the domain of begründen' – of what it is (for beings) to account for (themselves as) beings – again, mindful of the fact that logos may be translated as 'account'. That is, while ontologically-involved disciplines such as Philosophies of technology might turn to the question of ergründen (the provision of grounds), and while Heidegger's own Philosophical interest in the ontic-ontological difference might point down the track towards gründen itself (the ground as the essential relational difference between begründen and ergründen), a discipline called

'Technology' could well confine itself to the strictly ontic question of begründen. This suggests a centrality, for us, of accounting (logos), and particularly of the ways technological beings may necessarily be involved in self-accounting practices.

Now there is an irony here, because, as we have seen (right from the start of the present investigation), Technology is to concern itself with 'the presentation and full articulation' of beings dominated by the technical. But what else can this 'presentation and full articulation' be other than, itself, a form of accounting? This leaves Technology, the discipline, as primarily an account of accounts, a meta-accounting even. There is then no hope of ideally separating Technology's disciplinary resources (its forms of accounting) from its topics or 'objects of study' (the forms of accounting that technological beings actually do, empirically, in the world). Even the descriptive accounts it gives – and we have already seen that Technology will be a descriptive rather than a critical or speculative discipline – will be part of the very order of affairs the discipline would ideally describe. In this area then, the distinction between 'data' and 'analysis' will be hard to make. To put this another way: theories and analyses of technology will not be able to avoid becoming co-members of the family of technological forms. Heidegger describes this circularity as inevitable:

Being grounds beings, and beings, as what is most of all, account for Being. One comes over the other, one arrives in the other. Overwhelming [coming over] and arriving appear in each other in reciprocal reflection [reflexivity?]. Speaking in terms of the difference, this means: perdurance is a circling, the circling of Being and beings around each other. (Heidegger 1969:69)

What this account of the circling relation shows is that, no matter how much the discipline of Technology may try to confine itself to the domain of the purely empirico-ontic, no matter how much it might want to deal solely with beings' accounting, what it is that is accounted for will always be Being itself, ultimately. No purely ontic investigation, then, is possible in the strict sense. The difference between Being and beings must, on Heidegger's account, always assert itself, no matter how 'analytic' or, indeed, how 'speculative' the investigation.⁹

3.

From this, we can begin to see that what may well come to characterise beings – with respect to their grounding relation to all Being – is 'accounting for the ground'. For just as Being provides the ground for beings, so beings account for the ground that Being provides. And in addition to this, given the discussion in section 1, above, we must be led to a question concerning technological beings: what is specific to the nature of their particular accounting (for the ground that Being provides)? Or: what is the form of self-accounting of technological beings?¹⁰

Today, especially in 'studies of technology', there is much talk of all things 'cyber'. We hear of 'cyberspace', 'cybernauts', 'cyborgs' and the rest of the multitude. But what if we were to reconsider the 'cyber' as a domain of beings and examine that domain according to some of the ideas stemming from our reading of Heidegger and particularly with respect to the idea of the centrality of accounting? Our question, then, might be translated into the question of the forms of accounting of cyber-technologies, as just one case in point.¹¹

Traditionally, the idea of the 'cyber' is associated with Norbert Wiener who, in *Cybernetics: Or Control and Communication in the Animal and the Machine*, described his own fledgling discipline as follows:

We have decided to call the entire field of control and communication theory, whether in the machine or in the animal, by the name Cybernetics, which we form from the Greek κυβερνητης or steersman. In choosing this term, we wish to recognize that the first significant paper on feedback mechanisms is an article on governors, which was published by Clark Maxwell in 1868, and that governor is derived from a Latin corruption of κυβερνητης. We also wish to refer to the fact that the steering engines of a ship are indeed one of the earliest and best-developed forms of feedback mechanisms. (Wiener 1961:11-12)¹²

Note here that, right from the start, from the title of the book and from the definition of the discipline, Cybernetics is interested in a property of systems: whether animal (including human) or machinic. No distinction is drawn at this level. Instead, the critical idea is that some beings can self-control (or self-steer) via feedback mechanisms

while others cannot. Wiener's goal is the understanding of those mechanisms whether they be cognitive, neural, social, mechanical or, for us today, located in complex hardware/software assemblages. Might this idea of feedback be significant for our question of accounting and technology?

What is crucial to the field of Cybernetics, then – what marks out its distinct objects – is the feedback that produces recursion. State *s*1 becomes state *s*2 by virtue of an operation which (in either an identical or a modified form) is reapplied to *s*2 to generate *s*3, and so on. In this case, the act of 'steering' oneself is a case of governing and being governed, reflexively, in the same instant. There is no strict active-passive distinction in a situation of feedback, recursion or re-iteration. (This is part of the usual definition of a reflexive verb: it describes an action of something upon itself.¹³) The cybernetic is, then, in its brutest form, the field of self-governance; of any system's actions as, and upon, itself.

What cybernetic machines have in common with cybernetic organisms – and all organisms, on Wiener's, definition, must be cybernetic in so far as they are self-governing in their self-propulsion – is that they govern themselves (and are governed) reflexively. And here the term 'reflexive' (again, as in 'reflexive verb') is intended to capture all the properties of self-re-iteration, feedback, recursivity and self-governing self-propulsion. This, we might say, is the ethos of organisms. And, with the advent of cybernetic machines, we now have to say that there are some machines that share this ethos.

The question of a cyber-ethos is not as far away as we may think from the question of ethics-proper. As Deleuze, in his reading of Spinoza, has pointed out, ethics (as opposed to mere morality or moral judgmentalism) is a matter of Ethology (Deleuze 1988:27, 125). It is a matter of what a body can do; its 'affects'. That is, it is not as if a body acted and then, upon a later consultation of its internal states – its 'intentions' or 'motives', for example – it decided whether or not the action was good or bad. And, a fortiori, the ethical cannot be a matter of absolute values of Good and Evil.¹⁴ These pertain only to moralisms such as, for example, technophobia and technophilia. Cyber(n)-ethics, then, does not come super-added to cyber-bodies. What a self-organising, self-governing, self-propelling (that is reflexive) body does is its ethos, its ethics. What is good for a body is whatever it does to enhance its powers of self-organising and self-governing self-propulsion. The good is an increase in reflexivity. And

the bad, again following Deleuze-Spinoza, is whatever it is that a body may do to decrease its reflexive capacity. All of this has to do with the field of bodily movement or motion – hence 'Ethology'. It is, on this view, bodies (whether, for example, human, animal or machinic) that have reflexive capacities; and so reflexivity precedes (and arguably makes possible) any feedback between, for example, 'minds' and 'technological environments'.¹⁵

Although things may well change in the future, perhaps in the very near future, it has to be said that while all cyber-beings (animal organisms, human organisms and some machines) are uniquely reflexive in their operations, only human cyber-beings are at present – and the 'at present' is very important – accountably reflexive. So here we come, finally, to Heidegger's concept of begründen; of accounts and accounting as such.

As a human reflexive organism, I display (that is, account), in and as my own actions, how it is that those very actions are to be taken by others of the same ontological sort as me. This is how the socio-cultural order so crucial to human self-organisation is possible. Or rather, this is what socio-cultural order fundamentally is.¹⁶

A basic but telling instance of accountable reflexivity as social order is discussed by Wes Sharrock:

Social order is easy to find because it's put there to be found. When you go about your actions [...] you do them so that (or in ways that) other people can see what you're doing. You do your actions to have them recognized as the actions that they are. When you stand at the bus stop, you stand in such a way that you can be seen to be waiting for a bus. People across the street can see what you're doing, according to where and how you're standing.... [Y]ou're standing at a bus stop and somebody comes and stands next to you and they stand in such a way that eventually you can see that these people are standing in a line and that one person's the first and another is the second, and some person's at the end. People stand around at bus stops in ways they can be seen to be waiting for a bus. (Sharrock 1995:4)

Human social order, then, is self-organising; it is cybernetic through-and-through; but it is not just cybernetic. It is also, and utterly, in the business of displaying – that is, producing-for-recognition or accounting – its cyberneticity, its self-organisation. It is not just

performed (standing next to a bus stop – which any animal or machine can do), it is accountably performed (visibly waiting for a bus – which a machine or an animal cannot do). The way I stand by a particular pole, perhaps under a particular shelter, so that what I'm doing is visible to everyone as 'waiting for a bus' (rather than, say, loitering) is an instance of accountability. Accountability is pragmatic and not necessarily linguistic, verbal or discursive – so, with or without words, I am, in the very doing of waiting for a bus, accounting for what I'm doing as waiting for a bus, as opposed to something else: for example, using the bus shelter to keep out of the rain for a while – which is a quite different socio-cultural practice.

Sharrock's point in the passage just cited cannot be over-emphasised: it is not as if there is a bodily movement or action and then a feedback-like accounting (organised, for example, intentionally). Rather the two, as the specific properties of human self-organising organisms – and such that that self-organisation is called, in general, 'culture' or 'society' – are indistinguishable. This is what is particular to beings like us, to our ethos.¹⁷ It is unique to the ethical positioning, or ethos, of such beings that they act reflexively-and-accountably in this sense. To account for their actions, in and as those actions themselves, is, then, the essence of the movement (reflexive encircling) of accounting that Heidegger speaks of through the idea of begründen.¹⁸

To the idea of such beings' unique capacity for accounting, we should now have to ask: is there a form of being other than 'man' that can do so? And depending on the answer, perhaps, after all, we shall know whether or not to agree with Stambaugh's insertion of that factor ('man') into the equation.

Still, as a matter of sheer principle, there is no reason why cybernetic machines should not have – though they presently do not have, as a matter of historical fact – exactly this ethos. Animals and other non-human organisms, I fear, are stuck without it forever. (Though one cannot be entirely sure about, say, dolphins and some of the great apes on this score. They at least seem to need a closer look.)

The question then would be: could (and if so when will) a non-human cybernetic body/device one day put itself in motion in such a way that anyone (including any other similarly advanced cybernetic machine) can recognise what it is doing because it has designed its motion to be not only self-governing but also accountably that (self-

governed) action? A cybernetic machine can build, say, a car. When will it do so reflexively and-accountably – such that what it is doing is indeed building a car but, above all, such that it is also doing so in a way that displays its motions as designed to be specifically that action for anyone (or some specific things like itself) to see?

If such a machine ever eventuates, it will be at that point that a sheer coincidence of self-organising cybernetic properties – held in common by some machines and all organisms (including human organisms) – will have become an ethical identity between our always-already cybernetic selves and cybernetic machines. That, if ever, is when the Turing test could be definitively passed.

4.

My colleague Barbara Gorayska wrote to me about a draft of the present paper along the following lines:

You start with comparing biology, 'an idea of all living things', with 'technology' as an idea of all things dominated by technology. You rightly go on to suggest that these are not the same sort of outlooks. To me 'technology' as a discipline is rather 'an idea of all technical things'. Then the two are comparable. We can study humans as living things. We can study the chemistry of human bodies, etc. Can we study humans as technical things?¹⁹

Can we study humans as technical things? It seems to me that the upshot of my look at Heidegger is that we can indeed (in fact, must) do what Barbara suggests and that we can do so in the form of a perfectly respectable discipline-to-come. Then we have to decide what we mean by 'technical things'. The way I have set out that decision in this paper should, I hope, already be clear. But let me try, in a brief coda, to rephrase this.

From the earliest days of Cybernetics, it was axiomatic that the capacity for feedback/feedforward (or its lack) is a critical way of differentiating among beings. There are those that have the capacity (say, worms) and those that do not (say, rocks).²⁰ This seems to be an important first cut. Then we have to go one step further in order to get an idea of what distinguishes human beings from, for example, non-human life-forms and machines. What I've tried to argue is that

there is – at least to date – a very specific form of human techné in contrast to its others (the animal, the machinic and what have you), and that that form is constituted by a possibly unique capacity which I call 'account-ability'. By that, it should now be obvious that I mean manifold ways of displaying what a being is doing in-and-as its very doing of it.²¹

So if we can 'study humans as technical things', as the discipline I propose to call 'Technology', this will have almost nothing to do with various kinds of mere equipment (the fishing hook, the printing press, the computer...) and almost nothing to do with distinctions between, for example, 'nature and culture', 'organic and inorganic' or 'mind and environment'. Rather, it will have to do with an always-possibly-permeable boundary between the kinds of beings that operate merely reflexively (to date: computers, steering engines, capybaras, ants, bacteria...) and the kinds that do so accountably (human beings and, for all we know today, ...).²² In this case, the possibility of studying 'humans as technical things' is transformed into the broader question of studying 'technological beings as such' – and with a continually open mind as to what the phrase 'technological beings as such' may yet mean.

One thing, however, is for sure: the qualifier 'cognitive' is a very important (perhaps the important) first approximation. But, at least from a Heideggerian perspective, it may cover, as we have seen, a multitude of yet-to-be-described possibilities.

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Notes

1. Because of possible ambiguities between discipline names and references to the phenomena specific to those disciplines (a matter discussed shortly), I will capitalise the former wherever the difference is important.
2. Gorayska and Mey (1996:2) tell us that: 'the mind has to be consulted not just as an abstract faculty, but as a human characteristic that develops technology, and is developed by it'.

3. An interesting counter-case transition would be 'Ideology' which started as the name of a discipline of study but now (as 'ideology') only refers to a supposed domain of objects (namely 'ideas' and, sometimes, false ones).
4. On the importance of the ontic-ontological difference for thinking the possible kinds of beings that there can be, see McHoul (1999).
5. In the 'Letter on Humanism', Heidegger (1993a) describes technology as a form of truth grounded in the history of metaphysics. The present paper is an attempt (anti-Heideggerian as this may be) to acknowledge and work with this situation rather than to undermine it. For me: that's what we're stuck with, if we are to talk about technology (i.e., do Technology) at all.
6. See especially Division I of Being and Time and the commentary on it in Okrent (1988).
7. On science, see Heidegger (1978c). On culture, see Heidegger (1978b). On art, see Heidegger (1993b).
8. Identity and Difference consists of two sections: 'The Principle of Identity' (1967:23-41) and 'The Onto-Theo-Logical Constitution of Metaphysics' (1967:42-76).
9. The method that uncovers this self-assertion of a fundamental difference (regardless of any text's ideal goal of pure speculation or pure descriptive analysis) is called Destruktion in Heidegger and 'deconstruction' in Derrida.
10. With respect to cyber-technologies, the question of accounting is also taken up in McHoul (1998). Some of the following discussion relies on a section of that paper.
11. Another important instance, calling for a separate investigation, would be genetics, genetic engineering, genetic modification and the rest.
12. Wiener's reference to the Maxwell paper is as follows: Maxwell, J.C., Proc. Roy. Soc. (London), 16, 270-283, (1868). Note also Wiener's variant spelling of 'χυβερνητησ'.
13. The usual definition (Rowlinson 1991:30) runs: 'Reflexive verbs are verbs whose direct or indirect object is the same as their subject (he scratches himself; she allows herself a chocolate)'.
14. Here Deleuze reads Spinoza in a way that leaves him uncannily redolent of Nietzsche. My colleague Paul MacDonald has also kindly reminded me that 'Long before Deleuze, Steward Hampshire (in the 1950s) argued very persuasively for an interpretation of Spinoza's integrated human (living) being in terms of continuous, self-regulated exchange of energy quanta with its immediate environment'.
15. I refer here to another foundational principle of Cognitive Technology: the recursivity of 'the movement between the products of CT and the processes of TC [technological cognition]' – see Gorayska and Mey (1996:3). The

- position I'm taking here by no means denies that proposition, it merely recasts it in the light of Heidegger's position to the effect that Dasein's fundamental capacities – given by the existential analytic in Division I of *Being and Time* (1962) – precede and enable secondary forms of 'cognition' about them. To unduly simplify: the capacity for using hammers precedes and enables any reflection that may (later) occur on the nature of hammering. A similar actional, as opposed to strictly mentalistic, approach to 'cognitive' technologies is most cogently argued for in Button et al. (1995).
16. The ramifications of this for the traditional cognitive disciplines are dealt with in McHoul and Rapley (2000, in press).
 17. This is one of the reasons for Heidegger deferring to the term 'Dasein'. In doing so, he means not just human beings but any (potential) beings of the same ontological kind as us, and such that the point of the investigation is a specification of that ontological kind rather than of any current, empirically-available, instance of it.
 18. The question of account-ability as the critical mark of what it is to be a social being (or 'member') is first announced in Harold Garfinkel's *Studies in Ethnomethodology* (1967). For our present purposes this can be summarised in the formula:

$$A = (\text{def}) f^t (P, R)$$
That is: Account-ability is (defined as) a reflexive function of the co-Production and co-Recognition of social objects.
 19. E-mail communication, 16th February 2001. Some e-glitches are cleaned up in this quoted passage from Barbara's letter.
 20. I hope my general point will be taken here, notwithstanding the fact that some rocks can become silicon chips, and notwithstanding Thomas Pynchon's (1973) broader speculations in *Gravity's Rainbow* about 'rock consciousness' which, he projects, would have to work in 'frames per century'.
 21. So, for example, we call computer simulations of this capacity 'user-friendly'. An instance would be software applications whose buttons have hot-spots (cursor run-over points) describing their functions. A reverse instance would be the Martians' instant destruction of the peace dove in the film *Mars Attacks* — where an apparently 'universal' icon is mistaken for something else.
 22. Again, the ellipses point to the importance of making the technical term 'Dasein' more routine in 'technological studies'.

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