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Thinking Better about Better Thinking

In this chapter, I shall look at the possibility of cognitive enhancement and the contribution that it might make to flourishing. Cognitive enhancement is, in the words of Nick Bostrom and Anders Sandberg, ‘the amplification or extension of core capacities of the mind through improvement or augmentation of internal or external information processing systems’.¹ Their understanding of cognition extends to methods of acquiring information, processing it, remembering it, and putting it to use; as such, ‘[i]nterventions to improve cognitive function may be directed at any one of these core faculties’.² For the sake of this chapter, I’m going to accept their definition of cognitive enhancement, though I will avoid talking about new ways to acquire information – though Bostrom and Sandberg do talk about direct brain-computer interfaces, they do so in the context of using the brain directly to do things in the world³; and though we could imagine one day there being technology that would reverse this direction of flow and allow us to upload new knowledge and skills directly, it is too speculative at the moment to warrant much attention here.

From the off, I shall take as read that there are situations in which altering a person’s mental processes is desirable. Notably, there are conditions such as Post-Traumatic Stress Disorder (PTSD) in which a person’s mental processing of certain events is disrupted, causing their memory to intrude painfully into present life. There is some evidence that it may be possible to ameliorate this condition by the use of drugs such as MDMA (ecstasy), at least as an adjunct to psychotherapy; thus Mithoefer et al. state that

there [is] a favorable long-term risk/benefit ratio for PTSD treatment with just a few doses of pure MDMA administered in a supportive setting, in conjunction with psychotherapy. Should further research validate our initial findings, we predict that MDMA-assisted psychotherapy will become an important treatment option for this very challenging clinical and public health problem.⁴

Such interventions should be welcomed as ways to help people put right an aspect of their life that had gone wrong. Relatedly, drugs and implants might be able to slow or even halt the progress of age-related cognitive decline. However, such interventions should be remembered for what they are: attempts to make an aspect of a life that is currently not acceptably good better. As such, they too fall clearly on the ‘therapy’ side of the T/E distinction, and so their desirability won’t tell us a great deal about cognitive enhancement *qua* enhancement. What

remains to be seen is whether such interventions would provide all that much benefit to people whose cognitive capacities *are* at present at least acceptably good: whether they can help maximize flourishing by increasing the cognitive capacity generally.

The hypothesis that I'll be pursuing here is that their role will be fairly minimal. There's a couple of aspects to the argument. First, and least powerful, is that deciding what actually counts as a cognitive enhancement is not straightforward. Particularly in respect of memory, what it takes to make a person's life better is up for debate. But, more importantly, I'll be suggesting that, in many cases, bioscientific cognitive enhancement does not offer anything that could not be got non-bioscientifically – and what it promises may actually be parasitic on those non-bioscientific resources. Furthermore, in at least some of the circumstances in which cognitive enhancement may make a difference to someone's life, we might have independent reasons to doubt that it's necessarily the right strategy to adopt.

A hint about why I think that we should not get too excited about bioscientific cognitive enhancers comes from the fact that we can legitimately call a great many everyday devices cognitive enhancers. A pocket calculator is one such: it helps us perform fairly complicated arithmetical functions more quickly and more reliably than might otherwise be possible, and its memory function saves us the burden of remembering variables or formulae. More simply, a calendar, either paper or electronic, might also count as a non-intellectual cognitive enhancer, inasmuch as that it helps us organize our day. Even writing itself can be seen as cognitively enhancing: it allows us to keep a record of our own and others' thoughts, to communicate at large distances and over time, and so on, and allows us to solve the problems presented by a fallible human memory: it is much easier to remember the 20 or 30 characters of most alphabets than to try to remember the things that they may be manipulated to represent. People whose language uses non-alphabetic script have a harder time remembering what sign means what, and may not know how to decipher a word they've not encountered before – but it remains true that *any* kind of system that can represent an idea graphically dramatically reduces the mental burden of those who use it. Moreover, a character once learnt can be used in any number of contexts; and so even if your script requires that you learn many characters, that will still take less effort than having to learn by rote the content of every document in which they may otherwise have been put to use. Famously, it was precisely its role as a substitute for memory 'proper' that made Plato suspicious of writing.⁵ Given that we are familiar with a range of cognitively enhancing technologies, then, the question is this: is there any need, or indeed any benefit, from pursuing enhancers of a different kind by manipulating the brain and its processes?

It's with the idea of improving our memory that I'll start; I'll argue that there really isn't much to the idea that our lives would be much improved by means of bioscientific mnemonic enhancement.

Enhancing memory

Forgetfulness is annoying, even when it's not an indication of anything particularly medically sinister. It is not hard to come up with reasons to think that having our memories improved would represent a good and desirable use of bioscientific interventions, and technologies that could make us better at remembering things seem straightforwardly good, even in those for whom such interventions would not count as therapeutic; there is a level to which we are prepared to tolerate lapses of memory, but this doesn't commit us to thinking that it wouldn't be a benefit not to have to tolerate them.

Offhand, the benefits of mnemonic enhancement would seem to be considerable. On a workaday level, our lives would be made better – not necessarily by much, but by a noticeable amount – if we were less likely to struggle with passwords, vague acquaintances' names, and so on. Farah et al. point out that

[t]he ability to encode new memories declines measurably from the third decade of life onwards, and by the fourth decade the decline can become noticeable and bothersome to normal healthy individuals. Memory difficulties in middle or old age are not necessarily a harbinger of future dementia but can be part of the normal pattern of cognitive ageing, which does not make it any less inconvenient when we misplace our glasses or forget the name of a recent acquaintance.⁶

On a less workaday level, too, we might find significant benefits. For example, it is not hard to see how it might be highly desirable to have a better recall of something like the grammar and vocabulary of a foreign language; and there are times when we are better off for being able to bring to mind certain facts.

But, once we begin to scratch at the question a little, is there any guarantee that improvements in memory would make that much difference to our lives? Possibly not.

An important thing to keep in mind is that there is more to memory than the mere retrieval of detail. Memory is important at least significantly (if not wholly) because of what it does for us and the work to which its put. If memory matters to us, then implicitly it's because we want it to reflect reality. But this raises epistemic issues that open a range of questions about whether mnemonic enhancement would be able to do all that much for us. Someone who wants his memory to be improved is, implicitly, not interested simply in there being a narrative about things that happened in the past; it matters to him that the narrative is reliable. He should be able to tell the difference between a memory and a pseudo-memory: should it turn out that one of the things he 'remembers' didn't happen quite that way, he'd be disappointed. (Were he not to be disappointed, then there would seem to be that much less of a reason to seek mnemonic enhancement; confabulation would do the trick.) But this, at least sometimes, might be a real issue.

The worry here is suggested by some of Wittgenstein's comments on the impossibility of a private language. The idea here goes something like this: one can only really be said to understand a language when one can tell when the words within it are being used correctly or incorrectly. But a person who attempts to use a notionally private language – a language that only he speaks – would not be able to do this. Imagine, for example, that someone decided to formulate a private language and set about the task of assigning words to name the things in his world; call him Adam. Adam looks around the room and decides that *this* will henceforth be called a *zolog*, *this* an *urpisi*, those things *tirizmef*, and so on. He then decides – reasonably enough – that he ought to check that his new vocabulary has sunk in; and so he starts looking around the room again, repeating to himself the names he has invented. But how can he check that his recap matches the words he invented a little while ago? By what standard can he be certain that the object he is now inclined to call an *urpisi* isn't what he called *zolog* before? And – come to think of it – was it *zolog* or *solog*, anyway? Was *tirizmef* singular or plural? Was it even a noun or an adjective?

Adam can't check his use of the language against his memory of it, because it's his memory of it that he isn't sure of to begin with. (Trying to check that he has remembered his language aright by comparing it with his memory would be a bit like, to echo Wittgenstein, buying a second copy of the morning newspaper to make sure that the first reported the facts accurately.⁷) And since he can't in all honesty say that he can tell whether or not he is using even his own vocabulary correctly from one moment to the next, and has nothing against which to check it except his using it, he can't claim to be able to know his 'own' language.

Note that what's important here is that it doesn't obviously matter whether, at a matter of fact, Adam's recall is accurate. What matters is that he would never have any particular grounds to *think* it accurate if he remained the only source of authority about the language. In order to be able to say that he understands it, he has to be able to cross-refer his use with something outside his own head. There needs to be an external point of reference. In respect of languages, this reference point might be found in the everyday use of a word, or in something a bit more formal: we might imagine that, had Adam planned ahead, he would have used a notebook to record in English the words and grammar of his new language.

What applies to Adam and his use of language seems to me to apply to someone who has had her memory 'enhanced'. Let's imagine that Adam's partner – whom I'll call, inevitably, Eve – decides that she will make use of a new drug that promises to make her memory much more powerful. It certainly feels to her that details about names, bank PINs, and so on come to mind much more easily. But Eve, having been laughing at Adam's attempts to teach himself his new language for some time now, recognizes that those details could be

wrong: she might just *think* that she remembers them. Like Adam, what she really needs is some authority outside her own head to show her that what she *thinks* is a memory is not a pseudomemory after all. The point is that, if there is some fact about which we might conceivably feel a more-than-background level of uncertainty – and that covers all facts – it would do us well to have some extra-cranial standard against which we could check it.

Out of our heads

Now comes the important part: if people or things outside of a person's head are necessary to serve as the knife with which we can pare memory from pseudomemory, we can say that that outside world is (in a sense) a part of memory; the external reference corroborates the internal archive, thereby helping to ensure that the passing show of mental images, phrases, and so on really is a memory properly so-called. And each of these claims has important implications when it comes to assessing the point and benefit of mnemonic enhancement. After all: the external reference point is constituted by things like Adam's lexicon and Eve's downloaded timetable. It could also be found in other people: just as we are kept 'on track' in our linguistic habits by the network of communication of which we are a part, the same can apply to our memories. And these reference points would, quite obviously, be unaffected by mnemonic enhancers. Though such enhancers may mean that our 'internal' memories are, as a matter of fact, more likely to be reliable, the important point is that we will only be able to *say* that they're reliable with any confidence thanks to the possibility of checking them against the external world. And this constitutes, at the very best, a limit on the benefits that are likely to be derived from mnemonic enhancement.

Second – and following on from this – the outside world can be treated as an archive in its own right. A person does not have to remember everything in order to enjoy the benefits of a good memory: he just has to have access to a mnemonic repository of some sort. Just as the technology of writing means that one can have access to all the world's information without having to remember anything more than a few characters and some punctuation, so there are plenty of comparable 'extra cranial' archives. Other people can also figure as constituent parts of this archive, too: they can serve as means to fill in things that we can't remember ourselves, as well as providing a way to corroborate or dispute memories. What matters is that, if some aspect of the publicly-accessible world is required as a means to corroborate or disprove certain memories, those aspects themselves can be treated as stores of information. If there's something that we can't, but want to, remember, the simple thing to do is to ask someone who might be able to help fill in the gaps.

And this must prompt a question: can we really be so sure that mnemonic enhancements of a biomedical sort would provide us with all that much of a benefit? Without comparing our enhanced internal archive with the world around us, we won't be certain that it's any good as an archive; and given that the contents of any internal archive can be 'contracted out' to an external archive of books, electronic devices and friends, it's not at all clear that there'd be all that much to be gained from an enlarged internal archive to begin with.

What can't be stored in this way are the 'qualia' of memory: not the fact that your personal hero died on this day, but what it felt like to hear of the death of your personal hero. But this kind of memory couldn't be stored with any degree of reliability anyway: only the report that you felt that way. And if you do happen to fool yourself about those feelings: well, who really cares? Perhaps only those with a heavy investment in the right kind of concept of authenticity – but since memories wither when they are kept private anyway, this investment may only ever be dubiously well-advised.

Admittedly, there is likely to be a number of shortcomings with the external archive. For example, it might be that none of the witnesses to an event has a particularly good memory of what went on, and that the account we reconstruct is not true. The external archive is not static: just as words change their meanings or acquire new connotations, so 'crowd-sourced' memories may move around as well. Often, this won't matter – but sometimes it might: if the police are trying to reconstruct what happened at the scene of the crime, then a number of slightly unreliable accounts from witnesses might, collectively, generate a seriously misleading account. I'll return to this problem in a moment – though, for the time being, it's enough to note that this limitation does not directly link to any claims that we might make about the good life.

At other times, the shortcomings *do* have more direct impact: a student sitting an exam frequently can't consult with books and invariably can't consult with the person sitting next to her; a novice barman will have a need to learn the prices of the drinks he sells as quickly as possible. Hence we might think that, at least sometimes, it would be desirable to boost our own mnemonic capabilities to maximize our independence from the external archive.

This seems fair enough; but none of the examples above will show that mnemonic enhancement would be a particularly life-improving thing for most of us most of the time: our fallible memories are for the most part good enough, and when they give out, we can turn to the external archive. More importantly for the people in these examples, though, it is not obvious that the biosciences are necessary to make lives better: the barman's life can be improved, for example, by means of an electronic till that remembers prices for him, and then adds them up more reliably as well – even when the bar is noisy and busy. The most difficult confounder is presented by the student's desire to cram in a little more information. Still, this isn't enough to dent the general point; and, of course, we may want to question the educational value of

recall anyway: it's unlikely that there will ever be another time when a lawyer or doctor would not be able to use reference tools; what seems much more important is an ability to locate and use them. Remembering how to use a library or search engine doesn't require enhancement, though: rather, someone who can't remember that requires therapeutic intervention; and so her case doesn't really speak to the concerns I have here.

Criminal detection: A duty to remember?

Things are a little more complicated when we consider the possibility of mnemonic enhancement in the context of criminal detection. It might be that, if people had more acute memories for detail, it would be easier to reconstruct a chain of events, and as a result, it might be that justice is served slightly more effectively. (Wagenaar is sceptical about the possibility of such enhancements⁸: but we can still consider whether they'd be desirable should they be possible.) This may not be wholly desirable, though – at least on the grounds of a concern to improve the life of the enhancee. There is a couple of reasons for this. First, the witness to a traumatic scene might not benefit from being able to remember the details: it might be highly desirable for those memories to drift off and be diluted by time's passing, much as applies to any other memory. We've already noted that traumatic events that retain their currency may lead to PTSD and a need for therapeutic intervention. ('Mnemonic enhancement' might even amount to a heightened ability to forget – and here it's tempting to think of the film *Eternal Sunshine of the Spotless Mind*.) Second, even if there is no particular trauma associated with the memory, we would still be thinking about situations in which memory was enhanced not for the sake of the enhancee, but for the sake of some other end.

On the other hand, if flourishing is to be measured in terms of the capacity to perform typically human functions and roles, and to live better is to perform them better, this does open the way for a counterargument. For among human functions and roles is the ability to identify and discharge a duty. And it might be that we have a duty to remember for the sake of criminal justice. If it's plausible that the good life is a life in which one performs one's office, we might have a duty – or at least a reason – to remember after all *as a part of that life*. This is not a small consideration. Neither is it a small consideration that a functioning criminal justice system might be part of a well-ordered society, and membership of a well-ordered society might be a criterion of human flourishing; this would give an indirect reason to ensure that memories were as accurate as possible. But the point remains that memory in this context would be only a part of human function, and only a part of human flourishing. There is, for sure, room for debate about the strength of a 'duty to remember'. The point for the moment, though, is simply that it's a debate that must be had.⁹ We can't take anything off the shelf.

Memory and absentmindedness

The position at the moment is this: that there is room to be doubtful about whether neurological or pharmacological interventions designed to increase mnemonic capacity in individuals are in general really worth the bother. We might very well be able to augment their recall by making use of external resources, from diaries to conversations to photographs; but though such technologies do fit into Bostrom and Sandberg's 'amplification or extension of core capacities of the mind through improvement or augmentation of internal or external information processing systems', they seem hardly to be anything worth getting excited about. And it's not clear that we should get particularly excited about more high-tech ways of helping us not to forget, either. They don't seem to be so radically different in kind.

Before leaving mnemonic enhancement to one side, it's worth noting that recall is not the only thing that brains do, and the process of forming memories is not simply a matter of layering facts one on top of the other. We can also lose track of what we're doing, and thereby fail to form or consolidate memories to begin with. For example, if it's a warm day, and he's a lot on his mind, and his keys and wallet are in his trouser pocket, it might well be very easy for a person to leave a jacket behind somewhere and not notice for days afterwards – by which time, it's gone for good. The mnemonic failure here is not so much one of accurate recall; it could well be one of processing. For this reason, it's tempting to think that, if we could increase the brain's 'handling capacity' – its ability to keep several plates spinning – we could expect to be less forgetful. And, as such, it's tempting to think that making use of some kind of enhancement that could stimulate the brain to be able to keep track of more tasks at once would be highly desirable and life-improving.

However, it might be worth reining in our enthusiasm a little bit even here. The person who leaves his jacket on the park bench presumably has things playing on his mind that are, at least at that moment, more important; had there been less competition for his attention, he would have remembered it. So far so good.

A little extra mental capacity might have meant that comparatively small things like the jacket would not have slipped his attention. But is it obvious that dealing with a much greater number of things all at once really would be a trait worth cultivating? There is certainly an annoyance factor that might be avoided. However, it does not follow that never losing track of things is all-things-considered a benefit. One might speculate that, notwithstanding the occasions on which we trip up and we wish it hadn't, it could be a good thing that our brains have the ability to prioritize some things, and to push others aside: without it, we would find ourselves overwhelmed by calls on our attention, and end up intellectually paralysed.

In the story ‘Funes, the Memorious’, Borges famously and playfully cast doubt on the supposition that more memory is good; since he could not put to one side particular traits, it was difficult for Ireneo Funes ‘to understand that the generic term *dog* embraced so many unlike specimens of differing sizes and differing forms’.¹⁰ But one does not have to advert to fiction to question the idea that more memory is desirable, even when it is not traumatic. Citing the work of Daniel Schacter, Viktor Meyer-Schönberger suggests that

[u]sing generalizations, relying on conjecture, emphasizing the present, and respecting subsequent experiences, helps us to reason swiftly and economically, to abstract and generalize, and to act in time, rather than remain caught up in conflicting recollections.¹¹

It is admittedly possible that Meyer-Schönberger is romanticizing a little. But even given that possibility, there might be people who do have too many recollections.

For example, ‘AJ’, the subject of a paper in the journal *Neurocase*, can remember in astonishing detail facts about her biography from the age of 11, and is described as ‘both the warden and the prisoner of her memories’.¹² She reports that ‘I can’t let go of things because of my memory’ and that ‘[m]ost have called it a gift but I call it a burden. I run my entire life through my head every day and it drives me crazy!!! . . .’¹³ Her memory does not provide her with any particular compensating benefit, though: oddly enough, she even has difficulty with some aspects of recollection:

AJ reports that she never excelled in school and says she “hated” it. She reports she had trouble memorizing dates in history, arithmetic, foreign languages, sciences and “got Ds in geometry.” Memorizing poetry was painfully difficult. Yet she can recall with ease every one of her teachers since kindergarten.

In contrast to AJ’s strong autobiographical memory, and her ability to recall dates and events, she is not a gifted memorizer. For example, she told us she has five keys on her keyring and can never recall which key is for what.¹⁴

So – absent the suggestion that there is anything pathological about the things AJ can’t remember – an improved recall is not necessarily indicative of better memory in another sense; it may even be undesirable, and so it wouldn’t follow that we could always make our lives better by expanding our mnemonic capacity.

In effect, if the possibility of annoying absent-mindedness is the price we pay for having the ability to ignore unimportant things – which is, presumably, not only a desirable ability, but itself one that we might want to enhance in some cases – then it might be that it’s a price worth paying (even if that does mean having to buy a new jacket once in a while). Neither – to return to the jacket example – would it be as simple as all that to say that what would be really good is a heightened ability to prioritize better, so that we don’t relegate things that will later turn out to be important – not least because we often don’t have

that kind of predictive power, but also because emphasizing what might be important in the medium-to-long term might mean getting impossibly bogged down in the short.

Slightly more speculatively, we might wonder whether we can get carried away with the idea of mnemonic accuracy as the benchmark of desirability, and whether doing so would be to make a mistake about the role played by the memory in a flourishing human life to begin with. For sure, information retrieval is something that we want, and an ability to retrieve information that falls below a standard of reasonable acceptability is a problem that we might do well to solve. But humans are not information retrieval systems, and the fact that we have built machines specifically to be better at retrieving information than we does not tell us that it would be good to aspire to match those machines. Indeed, the fact that we do have such systems speaks to the relative unimportance of working to extend the range of the capacity of the human brain: what is the need to remember things given the ubiquity and ease of data-retrieval systems far more capacious and reliable than even the most boosted human could ever be?

More positively, people have a character that a PC simply cannot match; and a slightly ‘lumpy’ memory is likely to be one of the things out of which that character is constructed. Importantly, a lumpy memory allows for serendipity – not only is it the case that overhearing a snatch of a conversation may, for no particularly sensible reasons, help us home in on a thought that’s been nagging away for days, and this would not be possible were our memories more ‘efficiently’ stored; it might also be the case that being unable to put our finger on quite what it is that we want leads us down intellectual alleys that may otherwise have remained unexplored. In other words, lapses of processing that manifest themselves as lapses of memory may be the spur to creativity. (I’ll return to this point in a little while.) Making memory more efficient may turn out to be no enhancement at all.

Enhancing processing

There is, of course, more to cognitive enhancement than remembering things. At least as important is the ability to *do* things with the information to which one has access: in the bluntest terms, cleverness counts. Should it turn out that there is a way to increase processing ability, it’s easy enough to assume that it would be of benefit to make use of it. There’s a range of considerations that might be brought to the table to support this assumption. Some relate to the agent directly – that is, they relate to benefits that we might think accrue simply by virtue of increased cleverness. Some relate to the agent more indirectly – that is, they relate to the possibility that though cognitive enhancement *per se* may not make an appreciable difference to the agent’s quality of life, it does generate other opportunities that will turn out to benefit him.

One reason that we might have to pursue cognitive enhancement would be that it would give us a positional advantage over others in, say, the job market, and so contribute to the possibility of being more comfortably off in the long term. We might worry that emphasizing the positional benefits of cognitive enhancement could possibly erode other good things, such as solidarity. But a person who makes use of a cleverness-boosting procedure is not likely to suffer on this count; while someone at the bottom of the intellectual league may be isolated, the uniquely intellectually capable are not, I would contend, in anything like that position. Indeed, cognitive enhancement may mean that at least some people who would otherwise be alienated from the community around them are able to play a much more active and equal role in it, and so a barrier to their flourishing *qua* social beings may well be removed. Being better than your rivals is perhaps desirable; but being as good as them is also worth pursuing if you wouldn't otherwise be.

But not all the benefits of cognitive enhancement that accrue to the enhancee need be positional. It's also tempting to think that cognitive ability is its own reward.

The thought here is that a person is simply better off by virtue of having a deeper cognitive well from which to draw and that it is better by some standard to be more cognitively able than less. This kind of thinking is not entirely without intuitive merit, and at least on the face of things, it would not be difficult to generate a tolerably robust argument in its defence on a range of grounds and be in good company. Mill thinks that it is better to be Socrates dissatisfied than a fool satisfied.¹⁵ Were Socrates a fool, it would be hard to see why it would be better to be him than the other fool – that would appear to amount to the idea that it's *ceteris paribus* better to be dissatisfied than satisfied, which is a little too strange to accept. So we have to assume that Mill is thinking about the famous Socrates, who is not a fool. In that case, it's tempting to infer that Socrates' greater wisdom is the kind of thing the value of which can offset his dissatisfaction simply by being there. In a more Aristotelian mood, we might argue that, since intellect is one of the defining characteristics of humanity, it is therefore simply a good thing to have *qua* human.

Yet, although I would not want to dismiss this sort of consideration out of hand, I think that it is worth being a little circumspect. Even if we think that the benefits of intellectual ability are measurable in non-positional terms, it might be that each additional 'unit' of enhancement contributes less to the flourishing of the person who is enhanced. This being the case, the reason to get further enhanced would diminish with each enhancement, until at some point the possibility of extra-cognitive ability would be a matter of indifference to the would-be enhancee. This might make a difference to our decisions about whether there is much point pursuing the enhancement. (If Socrates is dissatisfied not despite, but because of his wisdom – maybe his knowledge that he knows nothing is the source; the fool is even more restricted, for sure, but

his ignorance is one of the things of which he is ignorant – it might even be the case that extra brainpower might have a marginal malefit!)

A case for there being a diminishing marginal return on extra processing capacity is fairly straightforwardly made. While there may be people who are cognitively retarded in such a way as to mean that they struggle with more or less every aspect of everyday life, and in whose case some intervention that increases cognitive ability may plausibly make a significant difference to flourishing, providing an intervention that is capable of generating the same improvement in cognitive ability to someone who is able to cope perfectly well with everyday intellectual demands may, with equal plausibility, make much less of a difference to their life; after all, if the world demands no more of them, their extra ability may never generate any extra benefit. Having extra cognitive capacity in no more challenging a world may be like having a million extra pounds when the shops are shut. Now, the retort to this is that, in a world that is ever-more cognitively demanding, even the highly-functioning may well benefit from *some* enhancement. I'll return to this retort towards the end of the chapter: such a world may itself be antagonistic to flourishing.

For the time being, it's enough to raise the question of whether being more intellectually able would always generate benefits. It's true, of course, that there's a range of things that I might be able to do, or do better, if I could boost certain aspects of my intellectual capacity: cryptic crosswords have always been a weakness, and they generally leave me baffled. Maybe that's just because I don't attempt enough, and I would improve with practice; but let's imagine that my failure is attributable to some part of my intellect that is stuck in a low gear. Maybe, on the basis that it's better to be able to do things than not, my life would be improved by being able to shift this part of my mind up a few gears. But it is, I admit, hard to see how this would really improve my life. Perhaps the problem is, as Mill indicates in respect of the fool and Socrates that I simply can't see what I'm missing.¹⁶ In that case, however, I am not in a position currently to say that I'm missing anything. Were there to arise some identifiable need to complete cryptic crosswords, I might have more of a cause to desire enhancement in that sense. At the moment, I don't; the same applies to other tasks that cleverer people might be able to perform. But Socrates is dissatisfied, and I have yet to be convinced that I would be better off if I were too.

Even in respect of tasks that we want to perform but for which we do not have the cognitive wherewithal, it is not obvious that enhancing by tweaking the mind would have much of a role to play in realizing our desires. Just as things like writing and the microchip allow us to outsource our mnemonic capacities, so there is a range of ways in which we can boost our processing abilities externally. Adding long lists of numbers is easier with a paper and pencil; more complex tasks – say, working out the likely path of a hurricane – require a computer. Nor is it obvious that there need be any less satisfaction derived from being able to get these 'external brains' to work for us. A physicist

who has worked out the mass of a new particle may have been unable to do the work without sophisticated electronics; but that is hardly likely to diminish his sense of achievement, or rule him out of the Nobel prize. (There's a shade of the Real Tomato Argument mentioned briefly in the last chapter here: the achievement is undiminished, even if it did come with assistance.) Once again, the hypothesis that suggests itself is that cognitive enhancement is not necessarily the way to increase the goodness of a person's life; and – perhaps more importantly – that even if an enhancement is in order, it isn't obviously going to have to be of the sort provided by the biosciences.

One other sceptical worry about the claim that cognitive enhancement benefits the individual is worth mentioning, and it's to do with whether there's a pressure to enhance. Quite obviously, if we make use of cognitive enhancers for the sake of generating positional benefits, we have to be exceptionalist about things: we have to assume that we are the only ones using the technique (or any comparable technique), lest the positional difference be lost. But the converse of this is that, if there's a reason to believe that others *are* using enhancers, it will generate a pressure to enhance for the sake of not lagging behind. Is this necessarily a bad thing overall? Well, it might be, if a person – call him Bob – who was otherwise perfectly satisfied with his level of intellectual function felt pressured to enhance himself when he would otherwise not. The counter to this is to echo Harris' point about educational enhancement that I mentioned in Chapter 3: if being clever is better than not, the non-positional benefit would still be there for Bob to enjoy. But this does perhaps miss the point that, if Bob was not motivated to enhance himself cognitively by the non-positional advantages that doing so offered, these same advantages would not obviously strike him as much of a compensation for having been pressured to do so now. For sure, enhancement in Bob's case would have meant that he would not lag behind – but that isn't compellingly going to be the sort of thing that adds to flourishing so much as it's prophylaxis against the possibility that one might flourish less due to others' actions thanks to positional loss, erosion of solidarity, and so on. If being pressured to enhance erodes Bob's sense of freedom, or his sense of the kind of person that he is, it might even erode important aspects of his flourishing.

The argument from alienation

One of the arguments sometimes put forward in favour of cognitive enhancement is that it will maximize people's ability to live and flourish within an increasingly cognitively complex world. Quite obviously, modernity's characteristics are attributable to the workings of the human brain; but that brain itself evolved gradually, over thousands of years in which not very much happened that would demand significant high-order thought – and so the idea that the human brain is ill-suited to the demands of the world today is not

wholly surprising, and nor is it wholly implausible. Neither is it surprising that there should be suggestions that we could use cognitive enhancers to allow the brain to function in a manner more attuned to its environment.

In this vein, Bostrom and Sandberg write that

if modern society requires much more study and intellectual concentration than was typical for the human species in its environment of evolutionary adaptation, then it is unsurprising that many people today struggle to meet the demands of the school or the workplace.¹⁷

And if people really do struggle to meet the demands of the school or the workplace, and do so for the simple reason that they are human and human brains have been shaped more by thousands of centuries as hunters and pastoralists than by a few centuries as scribes, engineers and insurance brokers, then it is perhaps fairly natural to wonder, in the first place, whether humans today really are flourishing as much as they might, and, in the second, whether their flourishing might be increased by giving their brains a helping hand by means of some biomedical intervention. ‘Technological self-modification and the use of cognitive enhancement methods’, Bostrom and Sandberg continue, ‘can be seen as an extension of the human species’ ability to adapt to its environment’.¹⁸

This optimistic statement is not without its problems.

One slightly naïve response to Bostrom and Sandberg’s optimism might involve wondering aloud whether giving people enhancements to meet today’s requirements might yet turn out to be a bit of a waste of time in respect of tomorrow’s. A person will derive no benefit from being better able to flourish in environment *e* if the society in which he has grown to maturity now looks on the characteristics of *e* as being quaint and obsolete. However, this line of objection relies on having placed the weight of the argument on specific capacities; Bostrom and Sandberg are considering enhancements *in abstracto*, and we can easily imagine enhancements that have a high ‘teleological elasticity’ – that is, enhancements that would give the recipient a higher performance capacity whatever the situation in which they were put to work.

However, the optimism of Bostrom and Sandberg’s account does suggest that it is always the best thing to alter people to fit their environment; and this is a supposition that invites at least a degree of scepticism. Very plausibly, there are situations in which we might well think that altering people to meet the demands of the environment is not the way to go if we really are concerned with the good life. The reason for this is a concern about alienation. By this, I mean a situation in which people are enhanced as a means of achieving a good life understood not so much in terms of what a human life is or could be, but in terms of what it has to be given the socio-economic context.

Imagine that we lived in a world in which most humans were expected to work 100-hour weeks in hot and cramped conditions. Call this world 'Metropolis'. It is generally recognized that people do not flourish under such conditions; but a scientist (call him Rotwang) offers to make available an additive he has developed which, when added to the water supply, will subtly alter the neurophysiology of the people who have consumed it, so as to mean that they are better able to cope with the environment in which they find themselves. Would the flourishing of the people of Metropolis be enhanced by the use of Rotwang's additive?

It is tempting to say that it would be. It is better not to be exhausted and ground down by one's environment, and anything that can help avoid this ought to be seen as assisting people's flourishing. However, we should perhaps be a little wary of helping ourselves to this conclusion without further thought. For it assumes that it is desirable to keep the prevailing socio-economic conditions in Metropolis as they are, and that improving the lives of its citizens is a matter of fitting them better around those conditions. From the point of view of the good life, this is far from being self-evidently desirable strategy: for example, we could imagine someone advancing a claim that the good life properly understood involves and requires negative attributes like not being ground down by one's environment, but also positive attributes like the cultivation of intellectual and aesthetic capacities. Even if the negative requirement is satisfied by Rotwang's additive, it would appear tempting to wonder whether they would be living a particularly good life in the absence of the positive. Such an argument appears not to be wholly without merit.

More generally, a world in which we are prepared to make use of something like Rotwang's additive rather than alter the socio-economic conditions looks like a world in which there is an elevated chance of people being made subordinate to those conditions; and there are several arguments available that might lead us to suppose that that, itself, is antagonistic to flourishing. It's in the light of this kind of consideration that we can tell a story about alienation – the word is deliberately chosen because of its Marxist echoes¹⁹ – inasmuch as that the shape of the enhancee's life is determined by others' (perhaps an impersonal other's) models. Note this is different from the picture outlined in Chapter 1, in which a person might be persuaded to revise his account of the good life by means of public deliberation, because the worry here is that there *is* no deliberation. We could tell a similar version of the same story framed in Kantian terms, expressing a concern that Metropolis fails to treat its people as ends in themselves; or we might be attracted to an account inspired by Heideggerian worries about treating people as 'standing reserves' in the face of an overweening economic system.²⁰ Each of these accounts has its problems; but the point is that it is not unreasonable to wonder whether, in the first place, there are certain socio-economic systems that are antagonistic to flourishing (at least in any rich sense) and, in the

second, whether a system that is willing to make use of Rotwang's additive might be one of them.

The point is that simply talking about people adapting to their environment is not, by some way, the whole story. We need also to consider whether the environment is one to which we would reasonably want to adapt. Now: is today's world one to which it would be reasonable to want to adopt human capacities?

The world described by Bostrom and Sandberg, even though many people may struggle to meet the demands of the school or workplace, is probably not like Metropolis: the cognitive demands placed on us are well within the capacities of most people; and this, in turn, counts as some reassurance that a failure to cope with the world's cognitive demands is properly thought of as requiring therapy rather than a cause for enhancement as I outlined the distinction in Chapter 1. There is a case to be made for providing cognitive enhancers for the sake of some therapeutic purpose – but the point stands that this is a long way from having identified a case for cognitive enhancement across the board. It is certainly not an indication that we should be looking to make use of cognitive enhancers as a means of ensuring the unfettered growth of a technocentric world.

The social benefits of cognitive enhancement

These lines of argument have concentrated on what one might call the 'first person' aspect of enhancement – the benefits that we might hope would accrue to the enhancee in a fairly direct way. But it's possible that we might want to endorse the use of cognitive enhancements for other reasons, and that these might contribute indirectly to the flourishing of the enhancees.

Writing on the *Practical Ethics* blog in 2010, for example, Julian Savulescu suggested that

if one takes those people in the top 1% of the population of IQ, the top quarter of that top 1% produce more than twice as many patents as the bottom quarter. So even if you are in the top 1%, enhancing your IQ might enhance your creativity and inventiveness. It is important to recognize that cognitive enhancement is an important social and economic issue.²¹

This claim reasserts one made by Persson and Savulescu in 2008 – that cognitive enhancement would serve to accelerate this development:

If, say, the mathematical gift of Euclid and subsequent mathematicians had been biomedically or genetically enhanced, the human species would presumably sooner have reached the state of contemporary mathematics and, consequently, hypothetical present day mathematicians would have reached a state of the art that actual present day mathematicians cannot divine.²²

It is not impossible that enhanced mathematicians may be able to do things that are simply beyond the capacity of unenhanced humans; but

the most likely effect of cognitive enhancement by genetic or biomedical means may be to speed up a growth in knowledge that would otherwise have taken humanity a longer time to achieve.²³

And as for mathematics, so for other sciences. There are problems that face us today in, medicine, or meteorology, that we may not solve for generations at our present rate – if we are capable as a species of solving them at all. But were we to embrace enhancement, we may find that those problems that we can only solve slowly today become problems that we could solve quickly; and those problems that we cannot solve at all become problems that, sooner or later, we will.

The benefits appear clear. A humanity that understands the weather and climate better would be less vulnerable to at least some natural disasters. It might be possible to put a brake on anthropogenic climate change through climatological engineering; but even if that is impossible, it would be of great benefit to have a better idea of what will happen so that changes in crop patterns, public health measures, and so on, can be brought about the better to provide for the needs of humanity. By the same token, diseases whose cure currently presents us with a very hard problem might turn out to be much less tricky to deal with in a world where the top medical scientists are 10 per cent cleverer; cheap, clean, and renewable energy might be attainable (or attainable sooner, and more easily) if we were just a little smarter; and so on. Since we all have a reason to want diseases to be cured and cheap, clean, renewable energy to be supplied, we have a reason to support the means to achieve those ends – up to, and including, cognitive enhancement.

No less importantly, cognitively enhanced scientists might be better at spotting when they're on a wild goose chase, and so be better equipped to concentrate their energies on research that's likely to bear fruit. So it might be that we could present a case for cognitive enhancement being desirable on the grounds that it will make it more likely that beneficently-inclined people will be able to make the world a better place efficiently.

Before going further, it's also worth noting that Savulescu and Persson, in their 2008 paper, also worry that cognitive enhancement may have detrimental effects without ensuring moral enhancement – the promotion of pro-social behaviours – first.²⁴ The gist of the problem they outline is that scientific development has already made possible the prospect of weapons of mass destruction that could cause considerable harm; and expanding and accelerating this development will make it more likely that these weapons get into the hands of an increasing number of people. And

if an increasing percentage of us acquires the power to destroy a large number of us, it is enough if very few of us are malevolent or vicious enough to use this power for all of us to run an unacceptable risk of death and disaster. To

eliminate this risk, cognitive enhancement would have to be accompanied by a *moral* enhancement which extends to *all* of us since such moral enhancement could reduce malevolence.²⁵

I shall return to the question of moral enhancement in Chapter 7. However, their worry does not seem to be completely off the wall: if we have the ability to make every Watson a Sherlock Holmes, we presumably also have the ability to add to the villainy of Moriarty the wit of Irene Adler, with the attendant undesirable consequences.²⁶ Yet these worries can be mitigated. After all, if we can improve cognitive abilities, there is no reason to suppose that we couldn't make every Sherlock a Mycroft; and, anyway, the possibility of undesirable consequences may count as *a* reason not to do something, but it need not count as a sufficient reason. Many things have potentially undesirable consequences, but enough desirable ones to make them worth doing on balance all the same.

Does an appeal to scientific advancement, then, generate a strong reason to pursue cognitive enhancement? Not obviously. The argument has a number of vulnerabilities.

Let's begin by examining the appeal to the increased capacity for invention and innovation that would supposedly derive from cognitive enhancement. It's only superficially strong. If the production of patentable work is our yardstick on this front, it may well turn out that such production has *something* to do with cognitive ability; but the relationship is nevertheless much more complicated than is allowed for in that account alone. For one thing, simply noting the number of patents generated is quite a crude measure, since many (and maybe most) patents do not recognize major break throughs, but minor improvements or variations of existing inventions – and many other more ambitious patents come to nothing. This suggests that the intellectual ability of the patent-holder doesn't have to be titanic, and that a super-brain may not be all that important: the mere luck of having the opportunity to file a patent detailing a minor modification to some item or technique would count for a lot. This kind of luck is not enhanceable.

At the same time, real progress often comes in forms that cannot be patented as insight is slowly accreted – and so, even if this accretion were to be made faster by cognitive enhancement, patent figures would not be the best measure of success. But it is not obvious that the right kind of accretion would be much helped by enhancement anyway.

Besides: even if it's true that the top 1-in-400 (that is, a quarter of the top 1 per cent) produce such a disproportionately high number of patents, that's plausibly because they're the top quarter of a percent, rather than because they're extra bright. Patents and honours gravitate towards some people not so much because of their intellectual capacity as measured in absolute terms, as because they are cleverer than the others – rather in the same way that the gold medals and records gravitate towards athletes who are faster than the others, irrespective of whether they are particularly fast in absolute terms.

Dismissing a suggested measure of scientific development isn't the same as showing that there won't be any. But there are reasons to be sceptical about whether cognitive enhancements would make all that much of a difference to the speed at which major breakthroughs are made, because it's not a given that high cognitive ability is of central importance. Notably, massive institutional support is likely to be a factor in a good portion of the kind of work that makes a difference to human flourishing, patentable or otherwise, and the same applies to an even greater extent to Nobel or Nobel-equivalent work: though it's still just about possible for hobbyists or non-professionals to function at this level in areas such as mathematics – Grigori Perelman provides an example of this – it's very unlikely indeed. The fact that people like Perelman do exist demonstrates that institutional support is not a *necessary* condition for great progress; but the fact that so few people like him exist is at least a sign that it's a significant factor. Moreover, the institutions that play such an important role in supporting the work that create significant breakthroughs are likely to be the ones that attract the best brains anyway – or at least to have the ability to sift out the less-than-best – so there'll be a natural agglomeration of talent there. And this counts against there being much of a difference made by cognitive enhancers for another reason.

The agglomeration of talent in one place is likely to create a dynamic that increases the likelihood of significant work being done by anyone at all; it is unclear that one would need enhancements of the bioscientific sort to have one's intellectual performance boosted by being a part of a close 'community of talent': being part of that community is an enhancement in its own right, and there is no particular reason to think that chemical or neurological enhancement would add anything that such membership couldn't.

Vitally importantly, we should not forget that being a member of a community of talent need not mean being one of a group of corporate employees; the internet makes it possible to crowd-source intellectual power. For example, the website Kaggle describes itself as 'a platform for data prediction competitions'; effectively a forum for members of the public to try their hand at solving problems, it

allows organizations to post their data and have it scrutinized by the world's best data scientists. In exchange for a prize, winning competitors provide the algorithms that beat all other methods of solving a data crunching problem.²⁷

The website claims never to have failed to outperform a pre-existing accuracy benchmark resoundingly, explaining this in terms of the benefits of having several problem-solving approaches working at once, and in terms of there being inbuilt competition.

Real-time feedback is given on a live leaderboard, so when somebody makes a breakthrough, others revise their own algorithms to outdo the leader's performance. This leapfrogging continues until participants reach the full extent of what is possible.²⁸

If Kaggle's claims are to be believed, they represent a challenge to the idea that the means to improve the world could be had faster by enhancing individuals – or, rather, that enhancing cognitive ability has to be a matter of enhancing the contents of any one person's skull. It would appear that we can do better science, with world-improving outcomes, by facilitating interaction.

One might still suppose that enhancement techniques like drugs or direct stimulation of the brain would allow for a bigger boost. And – for sure – cognitive enhancement *might* mean that a certain number of discoveries might be made sooner. Lots of enhanced people logged into Kaggle might mean that it's even better than it claims to be right now. But whether they would be made significantly sooner, and in significant numbers, remains a moot point; and whether there would be any problems solved in a world with such enhancements that would remain intractable in a world without is dubious. For this reason, the idea that we would all flourish more in a world in which cognitive enhancement were the norm is one that is far from definite.

The benefits of distraction

One other reason for scepticism about the supposed benefits of cognitive enhancement may be worth noting, too: it might turn out to be counter-productive.

Let's return to the example of the student who wants to be able to boost her exam performance. She is worried about being easily distracted and wasting time doing things that are not conducive to study; offered a drug that will increase her concentration, she takes it. In her example, increasing concentration may be desirable. The same kind of thing could be said for a surgeon, who will have a perfectly understandable desire to focus his attention on the operation he is performing or about to perform – his patient's life and welfare may depend on putting the needle in the right place, or making a very precise cut. Finally, we might imagine a researcher who believes that we can, and maybe ought, to develop new drugs to combat disease for the sake of making the world a better place as quickly as possible – and that this imperative could be better satisfied were researchers a little mentally sharper and were able to concentrate more on the work they are doing. In all these cases, something to aid concentration would perhaps be welcomed, and treated as a cognitive enhancer.

I am happy enough to accept that, in the student's or surgeon's case, where there is a specific task in hand with clear things that need to be done, a lack of concentration might be problematic (though there is a set of questions about the use of examinations as a method of academic assessment that refuses to dissipate). But in the case of the researcher, this is not necessarily the case. This is because it's possible that the moments of staring out of the window, or checking the internet for the umpteenth time, are not always bad things.

Anecdotally, all kinds of breakthroughs have been made by people whose mind was *not* on the job in hand. For sure, much work remains to be done even if the outline of a basically good idea does come to people while doing other things. But, still, there is evidence to think that such events are not confined to anecdote and urban myth.

For example, a paper published in 2003 asked people who had achieved some level of creative success – as measured in terms of having patented, published or exhibited something – to perform a test that involved sifting out irrelevant information, and found that they were less likely to disregard such information and less likely to concentrate on the ostensible task in hand:

The results of these studies and analyses indicate a substantial and significant relationship between a variety of indicators of creativity and reduced LI.²⁹

...
These results lend support to the theory that there may be qualitative (e.g., failure to filter out irrelevant stimuli) as well as quantitative (e.g., high IQ) differences in the processes underlying creative versus normal cognition. . . . Thus, a deficit that is generally associated with pathology may well impart a creative advantage in the presence of other cognitive strengths such as high IQ.³⁰

Put into layman's terms, what the study indicates is that creativity is associated with intelligence, but also with what the writers call a 'failure to filter out irrelevant stimuli' – that is, a tendency to get distracted. Such studies should be treated with care; but if there is anything to the suggestion that there's a correlation between creativity and having a wide 'mental sieve', increasing concentration – tightening the mesh of the sieve – may not be the best way to solve some problems. The researcher may find that extra concentration helps him perform routine tasks and follow established protocols, but that what is required to solve new problems is the ability to think creatively in a manner that is not easily accommodated by those protocols.

So it's possible that what counts as an enhancement in one context might count as a retardant in another; a person may benefit from boosted concentration when it comes to finessing an idea, but there might not have been the idea to begin with had she been concentrating too hard. And finding a way to reduce latent inhibition might be a good way to generate ideas, but might get in the way of translating those ideas into anything concrete.

Is this such a worry? Couldn't we fairly easily imagine a world in which people recognize that sometimes there will be a need to concentrate, and sometimes there will be something to be said in favour of free-association, and in which they adapt the enhancements they use accordingly – sometimes taking drugs to focus, and sometimes taking drugs to dream? Of course we can. But the problem is not that different drugs may be required at different times, but that people may not be very good at knowing which would be the right drug to take. For example, as I write this, I'm half-listening to the sounds coming from outside my window, thinking about the phone call I need to make later and

the train journey I need to make tomorrow, and wondering why a patch of my lawn has died. I'm also thinking about the couple of chapters that are currently proving more difficult than expected to get onto the page, and about the missed publisher's deadline. It's tempting to think that if I could mute this mental noise, I would write more efficiently and clearly. But even when I'm doing or thinking about something else, it's possible that problems I'm encountering in building the argument are simmering away somewhere on a mental back burner, and that that is the best way for them to be solved or avoided altogether. Whether this possibility corresponds with reality is hard to tell; but unless we can tell, there doesn't seem to be much point in taking a drug to enhance the characteristic we think we need to accentuate; we might have chosen wrongly.

Alienation revisited

It's worth revisiting the 'Argument from Alienation' in this context of a consideration of the alleged social benefits of cognitive enhancement. It might not be desirable to promote cognitive enhancement as a means to generate welfare, because in doing so, one risks treating the would-be enhancees as functionaries of an overriding concern for welfare. It might be that people like Savulescu and Persson are correct to suspect that a world in which people are cognitively enhanced will be a world in which there are more good things, more quickly generated. For the sake of the argument, let's let that pass. However, there remains the possibility of embracing these good things as a desirable spin-off from enhancement, rather than as a reason to enhance in their own right. That is: there's a moral difference between a world in which people are cognitively enhanced for their own benefit, and – as a consequence that is foreseen and welcomed but not directly intended – happen to be in a position to generate a range of social benefits as well, and a world in which it's the social benefits that are in the moral driving-seat; and even if Smith himself is one of the people who benefits in the long run, this probably oughtn't to diminish the worry too much: what counts is that Smith would be a component part in the welfare-generator.

It may be harder for Smith to flourish in the face of the expectation that he will generate benefits. Indeed, in the face of this expectation, he may be less motivated to do anything much at all.

The case for cognitive enhancement: Not wholly proven

As I noted at the start of the chapter, humans have been making use of cognitive enhancers for thousands of years; some of these enhancements are as simple as the proverbial knotted handkerchief, and others are as complicated as a

supercomputer. The reason these inventions have caught on is not, I would contend, because they help us make the world a better place – although they might. The reason they have caught on is the same as the reason why threshing machines have caught on among agriculturalists: they make life easier. From the point of view of securing and maintaining as good a life as possible, this is important. A person who has to labour hard for that outcome is, fairly straightforwardly, living a less good life than someone who has to labour less hard for the same outcome.

There is a role for cognitive enhancers in improving our lives, just inasmuch as *some* kind of cognitive work has to be done, and if something is available that will make that work easier, then so much the better. What is less clear, though, is that there is much of a role for ‘neuromanipulation’ as a means of enhancing the functions of the mind. We already know how to outsource a good many of the intellect’s tasks, either to people or to things; the idea that bioscience may be a way to ensure flourishing is not obviously one that we have to accept. That is to say: a would-be cabbie may – let’s say – find that his life is improved if some stimulus can be applied to the hippocampus, a region of the brain that has been found to be larger than average in London taxi drivers.³¹ On the other hand, it would also be improved by buying a satellite navigation system. And while a satnav might mean we admire the knowhow of cabbies slightly less, it wouldn’t remove anything all that important (and, anyway, the job might still require *noûs*). The same applies in other walks of life.³²

More tentatively, we might wonder, too, about whether ‘workaday’ improvements in cognitive functioning would really be necessary to make life better – and whether their promotion might make life worse. I noted at the start of this chapter that lapses in memory – as when we forget a colleague’s name – might be embarrassing, and make some kind of enhancement attractive. One might be tempted to wonder whether at least some of the badness comes from embarrassment; but if Farah et al. are accurate in saying that this sort of lapse becomes more common from the fourth decade of life onwards and is completely unremarkable, one way of mitigating that badness is to remove the embarrassment by simply admitting to ourselves and others that we aren’t as quick as we once were. Promoting enhancers by drawing attention to these small errors could in fact contribute to the creation of a problem that the enhancers are supposed to solve. Lapses in memory may threaten a dip in flourishing; but being ashamed about them, when they are so trivial, may threaten something equivalent.

In some circumstances, some form of artificial improvement of intellectual capacities by bioscientific means may be desirable. Yet what seems clear is that the desirability of boosting people’s brain power depends on us working in a certain precise context – surgery, or revision, or something of the like. This isn’t enough to back up the claim that cognitive enhancement is generally all that desirable or worth the effort. Cognitive enhancement may well have benefits to

those who struggle with the world, but it doesn't follow from that that it will benefit everyone; and if the benefits are more widely distributed, it still doesn't follow that bioscientific means would be the best way to realize them. It is quite possible that they wouldn't be. I advance as a hypothesis that, by being satisfied to farm out our cognitive processes to books, computers, and other people, we would lose no significant benefit.

Notes

- 1 Bostrom and Sandberg, 2009, p. 311.
- 2 Ibid., p. 312.
- 3 Ibid., p. 321.
- 4 Mithoefer et al. 2013, p. 36; cf. Sessa, 2007, *passim*.
- 5 see Plato, 1952, 274c ff; 1981, *passim* (but esp. 81b-e and 85d-e); but cf. Plato 1999m 142d ff. vide also Havelock, 1982, pp. 41–7.
- 6 Farah et al. 2004, p. 422.
- 7 Wittgenstein, 2001, § 265.
- 8 Wagenaar, 2008, *passim*.
- 9 Vide Vedder and Klaming, 2010, pp. 29–30.
- 10 'Funes, the Memorious', in Borges, 1998, p. 104. For Plato, an understanding of the idea of the dog-in-general would require remembering the Forms; for Borges, it would require forgetting.
- 11 Mayer-Schönberger, 2009, p. 21.
- 12 Parker et al. 2006, p. 46.
- 13 Ibid., p. 35.
- 14 Ibid., pp. 38, 42; slightly modified.
- 15 Mill, 1998, p. 140.
- 16 Ibid.
- 17 Bostrom and Sandberg, 2009, p. 324.
- 18 Ibid.
- 19 see Marx, 1970, *passim*.
- 20 see 'The Question Concerning Technology', in Heidegger, 1999, *passim*.
- 21 Savulescu, 2010, slightly modified.
- 22 Persson and Savulescu, 2008, p. 165.
- 23 Ibid., p. 166.
- 24 Ibid., *passim*; cf. Persson and Savulescu, 2012, *passim*.
- 25 Persson and Savulescu, 2008, p. 166.
- 26 Irene Norton, *née* Adler, is a character in the story 'A Scandal in Bohemia', and one of the few people to best Sherlock Holmes. Holmes refers to her 'always under the honourable title of *the* woman'.
- 27 <http://www.kaggle.com/>.
- 28 <http://www.kaggle.com/about>.
- 29 LI stands for 'latent inhibition', which is the tendency to pay more attention to novel stimuli than familiar ones.

- 30 Carson et al. 2003, p. 505.
- 31 Parts of the hippocampus have been found to be enlarged in London taxi drivers who have done 'the knowledge' (see Maguire et al. 2000); this kind of phenomenon would seem to suggest, first, that the brain is fairly plastic, and second, that experiences can shape it. However, other work would seem to indicate that these gains come at a cost: taxi drivers appear to have a lower ability to acquire *new* visuo-spatial information than do bus drivers (Maguire et al. 2006).
- 32 cf. Bostrom, 2008, p. 30.