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OWN YOUR MIND
A Journey through the Brave New World of Brain Hacking

Translated by Caroline Waight

Where is my mind?

Pixies, 1988

Contents

<i>The Brain Station: Minding the Gap</i>	4
Conquering the Brain: On the Threshold of Neuro-Capitalism	
<i>Stop 1</i>	
The Brain – Into the Known and the Unknown	15
<i>Stop 2</i>	
In a Darkened Room – A Journey through a Senseless World	32
<i>Stop 3</i>	
Measuring the Brain – Searching for the How	61
<i>Stop 4</i>	
The New Frontier Spirit – The Mathematical Human Takes the Wheel	77
Me – Now New and Improved: From Understanding to Brain Hacking	
<i>Stop 5</i>	
Self-Optimisation – The Quantified Becomes the Qualified Self	96
<i>Stop 6</i>	
The 24/7 World – You Snooze You Lose	115
<i>Stop 7</i>	
Neuro-Enhancement – Pill-Popping for Performance	133
<i>Stop 8</i>	
Siri’s Relatives – From Speech Recognition to Mind Reading	155
<i>Stop 9</i>	
Brain Hacking – It’s Not Just Facebook, Google & Co. on the Case	169
Identity and Freedom: Who Am I, and How Can I Tell?	
<i>Stop 10</i>	
Merging Man and Machine: Who’s Taking Over Whom?	196
<i>Stop 11</i>	
The Night Train to Yesteryear: Memory Manipulation	213
<i>Stop 12</i>	
Thought is Free – Mental Self-Determination as a Human Right	228
<i>Stop 13</i>	
Lost in Transformation – Who Changes When My Brain Changes?	247
<i>End of the Line?</i>	
The Telepathic Human – Alone in the Universe of the Mind	274
Acknowledgements	281
Bibliography	283
Notes	288

THE BRAIN STATION

Minding the Gap

I've always been prone to trying things that aren't good for me. And I have a tendency to jump feet first without thinking overmuch about the consequences. Hence the decision, taken one April day in Boston in 2017, to write this book. After thirty-six hours without food or sleep I had an epiphany: the brain is a very subtle system, utterly fascinating yet still so little understood, unpredictable. When it comes to the brain we need to tread carefully, respectfully, before it's too late.

In Boston I'd just had my first experience of brain hacking, trying out a device that can stimulate the brain to be either more active or more calm. With the aid of an app, low-level current is delivered into the brain via two electrodes attached to the scalp. The current is supposed to affect the autonomic nervous system, producing a greater sense of energy or calm. An interesting experience, and certainly effective on me. I felt full of beans. So full, in fact, that I ended up vomiting several times, ruling out any hope of eating or sleeping for the next thirty-six hours. It might have optimised my brain, but I felt anything but optimal.

Behind this abortive experiment lurks the idea that it might be possible to use brain-stimulation to give our intellectual faculties a bit of a leg up – to become more successful, more popular, and maybe even happier. It's perfectly in keeping with the spirit of our age, for this is the era of the Self-Improvement Junkie. In this context a remark attributed to American management guru Peter F. Drucker (1909–2005) seems almost prophetic: "If you can't measure it, you can't manage it." Drucker, presumably, would have been thinking in terms of companies, which are best served by using hard numbers to orientate themselves. Today this simple formula has become our collective watchword: self-monitoring for the purpose of self-improvement, on every level – including that of the brain.

Almost everything we do can be measured, and thus compared. Fitness trackers, watches and other technical gizmos now make it possible to gauge our own level of performance, measuring steps, calorie consumption and stress. Yet counting and measuring alone are not enough: we've got to self-improve. Gyms promise that a mere twenty minutes of electrical muscle stimulation per week is enough to get you fit. Greater efficiency and greater effectiveness will make you happier, more successful, better appreciated – and healthier, too. The credo of the network "The Quantified Self" (quantifiedself.com) is "self-knowledge through numbers".

First, the self-measurers tackled the body: it was all about more activity, more sports, more and better-evaluated sleep, healthier eating, smoothies and detoxing. But it hasn't stopped there. Self-measurement and self-improvement have literally gone to our heads: now our thinking, too, must be enhanced. It started with Dr Kawashima's Brain Training, but it has long since metastasised into an any-means-necessary competition to see whose brain can perform most efficiently. Today, the notion that we can use technological tools to make our thoughts quicker, more precise, better – which is all brain hacking means – exerts a powerful attraction for increasing numbers of people.

There's a twist in the tail of my Boston story. Nobody knew about my little experiment, and days later, feeling like everything was back to normal, I returned to Berlin. When I got home and my wife opened the door, she stared at me in horror: "How come you look like that?" Anne had seen at once what I – given my evidently skewed sense of perception – hadn't even noticed. My face looked different. On the spots where the electrodes had been placed there were dents, as though someone had put my head in a vice

and given it a slight squeeze. “It’s kind of scary,” said my wife. That surely can’t be the logic of self-improvement: you’re suddenly able to think at warp-speed, but everyone else is avoiding you.

After a few more days all traces were gone, and I was back to normal. But in the photos I took in the days after the experiment, I can see what I looked like: I feel like a stranger in those images. Which is an apt metaphor for this book. If we start carelessly tinkering around inside our brains, believing we can influence and alter our moods, emotions and capacity for thought as we please, we’re making a dangerous presumption. Instead of thinking better, faster and more efficiently, we may be driving ourselves to madness. In attempting to self-optimize, we’re actually self-harming. Our brains contain the core of our personality, so to manipulate the brain *is* to manipulate our personality. The face of humanity will change if we start thinking of the brain as a zone of constant self-improvement and a financial resource. We will become strangers to one another – and to ourselves.

Yet there’s already a whole industry behind the ambition to optimize thought. Individuals are increasingly under pressure to be on constant standby, perpetually performance-ready. Medications such as Ritalin and Modafinil are used to achieve set goals – during exam periods or busy patches at work, for example –, in a phenomenon known as pharmacological neuro-enhancement. Neuro-stimulation via electrodes affixed to the scalp, as in my brain hacking experiment, is supposed to work within ten minutes, shifting the brain and its attendant human being into whichever phase of activity or calm is required by the situation. Just in general, things are a lot faster if you don’t have to type, swipe or click in order to engage with a computer or smartphone. Best of all? If I could simply think my emails into someone else’s brain. And this book could be much more rapidly thought into a computer than typed into it.

When optimal performance and optimal results become the benchmark for thought, we’ve got a problem. Because that’s not how thought works. Try sitting down on a chair and deciding to come up with a dazzling new idea for a text, a start-up, a new product, a piece of music. There’ll be plenty going on. Pressure rises, tension grows, frustration sets in; there’s only one thing guaranteed not to come out of this process: a good idea. Viewing the brain as an optimizable productive force doesn’t just change the way we think about the brain; it changes our conception of human beings. Only the quick-witted get ahead, so everyone else had better figure out how to optimize themselves and their brains. And if they don’t have the money? They’ll be out in the cold, part of the intellectual precariat. This would be a new age, one in which a person’s opportunities in life depend entirely on their cognitive capacity – an age of neuro-capitalism. Finding it too expensive to subscribe to the Brain Data Cloud at €299 per month? Then I’m afraid it’s welfare for you and your prematurely greying cells.

Among our modern myths is that we only use ten percent of our brains. This is flat wrong. But its wrongness doesn’t change the fact that it’s lodged in many people’s consciousness like a burr in wool. It also fits all too neatly into the logic of the new efficiency of thought. Resources ninety percent unutilised? Must be accessible, then. It’s a kind of neuronal gold-rush. Luc Besson, one of Hollywood’s greatest directors, even turned this nonsense into a recent film. It’s so bad you feel like suing the director for offences against the intellect, and yet it ended up at number one on the German box-office charts straight after its release. *Lucy* is the story of a woman who gains superhuman powers after overdosing on drugs. Her brain accelerates, and Lucy is able to make use of all the energy around her – she can even send text messages via electromagnetic fields. She sees the past

and the future, even faraway galaxies. And when her brain actually reaches one-hundred-percent capacity, she becomes pure energy, an omnipresent mind decoupled from bodily existence.

Okay, so maybe we don't need to go quite that far. But the notion that we can get more out of our brains using medication, jolts of electricity or permanent implants inside our heads has been around for a while. More than a hundred years ago, the American psychologist and philosopher William James wrote, "We are making use of only a small part of our possible mental and physical resources."¹ Humanity has been wondering ever since whether – and if so, how – it might be possible to improve the brain's performance, ironing out the flaws and deficiencies we can all perceive in ourselves from time to time. But is it really true?

When I make a cup of coffee in the morning, it happens almost automatically. It's a no-brainer, an action that requires virtually no mental outlay. But that's a misperception. In order to make the coffee, I've got to walk into the kitchen, approach the coffee machine, press the on button, probably refill the water – nobody else ever seems to do it – and the coffee, then put the cup underneath the tap, and finally add milk and sugar as required. For all that to work, there's a thunderstorm of neuronal activity raging in my brain, even though I don't notice it. Numerous areas of the brain change their activity, so that needs ("I'll have a coffee"), movements ("press the button") and sensory stimuli ("mmm, delicious ...") are coordinated. If you used functional magnetic resonance imaging to look at what happens in the brain whenever you make a single cup of coffee, you'd probably be amazed by how often it comes off without a hitch.

We're blithely unaware of how immensely complex even banal everyday actions are, and what incredible things our brains accomplish each and every second. Instead we demand more and more. In the old days we fine-tuned cars and motorbikes; today it's the turn of our grey cells. We're still on the threshold of a development in which the brain is a new object of the desire for self-optimisation, yet becoming better human beings seems already within our grasp, given the aid of pills, electricity, or conjunctions of brain–computer or human–artificial intelligence. Or perhaps it would be more accurate to say that becoming human beings who think more quickly and efficiently seems within our grasp. Better? That's debatable.

This brings us to a critical examination of the possibilities of brain-hacking, which cannot simply be carried out on an individual level. There needs to be a societal debate about what's possible and what's desirable. Where should the brain – as the centre of thought and individual personality – be protected? What demands can we make regarding intellectual self-determination, regarding intellectual intimacy and the protection of private thoughts? And who will be able to guarantee them? In the future, will we ourselves have the right to insist on this guarantee? What duties do we have here, what responsibilities?

I'm not a neuroscientist, and I don't want to pretend otherwise. I've spoken to many researchers and experts for this book. They all know far more about the brain than I ever will. But the questions I'm asking here don't just concern brain experts – they are relevant to everyone who wants to decide for themselves what should happen to their brain and their conscious mind. These aren't specialised scientific questions; they concern the future of our humanity, our autonomy and our freedom. That's why we can't leave the answers solely to neuroscientists. We've got to find them ourselves.

¹ William James: *The Energies of Man*. New York, 1908, p. 14.

When I started working on this topic years ago, a phrase popped into my head that eventually became the title of this book: my mind is mine. It's a phrase with historical resonance. It echoes another battle for self-determination that changed German society. In the seventies, the women's movement in Germany finally picked up speed. Under the slogan "My belly is mine", women fought for the right to abortion as an act of self-determination when it came to their own bodies and their own lives.

Being able to decide against something is very different from not being forced to make a particular choice. This is what's at stake when the brain becomes a new sphere of conquest under neuro-capitalism and we're all left facing completely new challenges. Will thought become a question of money? Will we still have the choice, in future, to rest contented with our intelligence, our cognitive abilities, in a world where there is an increasing proliferation of ways to polish them up and to improve them? Will we have the choice to keep our thoughts private if new technologies make it possible to read them directly from the brain and exchange them via digital networks? Will we have the choice to preserve the integrity of our brains in a world where a growing number of people have no problem allowing access to them via electrodes, computer chips or nanoprobes in order to become part of a global network of communication and knowledge, plugged into a data cloud we can access with every passing thought? For the time being, the answer seems clear: of course we'd have a choice.

Really? A glance back through technological history shows that major advances eventually prevail if they make life pleasanter and easier. At some point, so many people become part of the development that those still resisting get left behind. By now almost everyone has a smartphone in their pocket, using it like a remote control for their own life. In a few years all our everyday devices will be connected to the internet, all talking to each other. The fridge will decide when to order fruit and vegetables, and the washing machine will choose when to do the laundry based on the most cost-effective energy tariffs. A few years after that, we'll be ferried around our neighbourhoods in self-driving cars. We'll drive down streets selected for us by our cars, because that's the fastest option. These developments will make life easier and more comfortable. But they're the first steps along the road to the disenfranchisement of thought.

Once it's medically and technologically possible to make the brain a nodal point in this network, that will happen. Research teams at universities across the globe and companies in Silicon Valley started working ages ago on developing a brain-computer interface. They've already had some success. People can play computer games with their minds, write, and move a robot arm.

This is only the beginning. Once these possibilities are further developed and come into broader use, the brain will become an open book. In it we'll be able to read what's really going on inside us and inside others. It will offer a glimpse behind the curtain of our face, behind the "screen" of our personality. The information, emotions, wants and desires processed in the brain are part of the identity and uniqueness of each and every one of us. A vital part of our freedom is that this isn't visible and perceptible to all and sundry.

Around 1780, leaflets began circulating that protested against political surveillance and heteronomy in German cultural life.

*Thoughts are free, who can guess them,
They fly past like shadows in the night.
No man can know them, no hunter shoot them*

With powder and lead: thoughts are free.

Yet now the hunt for thoughts is on. It has its own manifold appeal, decoding the secret of thought and making it accessible. Not least because it promises new markets and new sources of income. The first company to offer a market-ready mind-reading or brain-to-brain communication device will kick off a billion-dollar competition. No powder and lead required. A brain-computer interface will be enough to tap into thoughts. Nobody will have to guess what they are – we'll simply be able to read them.

This development will continually pose new and radical questions. Who's actually doing the thinking when countless brains come to a joint result through mind-crowdsourcing? Who holds the copyright to a thought read from one person's brain then processed elsewhere? Will there be a data protection act for thoughts? And how will we prevent the emergence of a "thought police" – which could arise by the mere fact of technical feasibility – à la George Orwell's *1984*?

On the threshold of neuro-capitalism, the Marxist maxim "being determines consciousness" no longer holds. In the world of networked minds, consciousness determines being. Is my mind really still mine, then? I hope so. But to make sure it stays that way, I'll have to take action.

We can't allow a world in which a person's ability to keep pace is dependent on the electrification of the mind. If the unadulterated state of personhood becomes a disadvantage for survival, then we've got a problem.

My mind is mine. This is more than just a slogan advocating the individual's right to make his or her own choices about the brain and consciousness. It's also a phrase that, for me, gets to the core of a human, democratic and free society. Everything that makes a human being a human being is brought together inside the brain. If you manipulate the brain, you're messing around with the self, so before we start tinkering we'd better make sure we truly understand it, right down to the last detail. Despite all our progress, that's still far from the case. In the meantime, we cannot let others decide for us whether or to what extent we make our brains a sphere of self-improvement – that decision must fall to the particular brainiac who's looking to be brainier still. If you want to expand (neuro-enhancement) or alter (brain hacking) the performance of your grey cells using medication, electrical stimulation or a brain-computer connection, then go ahead. You should be free to do so.

But we've got to structure this new world.

Stop 2

In a Darkened Room – A Journey through a Senseless World

Wouldn't it be nice if we could start a conversation with our brain? Ask it: Would you like to be improved? Would you like to be hooked up to new technologies so you can accomplish more? Would that be good for you, me and the both of us? It would really help clarify things if you could negotiate with your own consciousness what should change, what both of you would allow and where you'd push back. You'd soon find out where the boundaries of self-optimisation are.

Sadly that's not possible. In this imaginary conversation, you slide straight into an epistemological problem. You can't observe your brain at work and ask it whether it's permanently happy or whether anything is changing. It just sits in your head. And even if you could harmlessly remove it, cradle it in your hands and gaze at it with rapt attention, you wouldn't see what you'd have to see in order to answer your questions. You could ask your brain: "Are you doing alright?" and "How would you like to participate in our plans for you?". But the likely result would be people in our immediate vicinity advising a trip to the nearest psychotherapist, not a satisfactory answer.

The brain, as the central organ of our thinking and behaviour, is simultaneously observer and observed. But that's a non-starter. How so? Well, that's a major focus of sociology, and especially of the theorist Niklas Luhmann. He called it the system-environment difference, and unfortunately it's as complicated as it sounds. Put simply, the term describes how a system – i.e. a person, and also a brain – can only ever observe its environment, not itself. If you try to observe yourself, you'll wander into a blind spot and perish. I can observe my hand in motion, reaching for a glass or grasping another hand. So far so good. But I can't observe myself observing or thinking. Whenever I attempt to do so, I find myself already up to my neck in it. I'm the subjective prerequisite for the observation of my subjectivity. I'm both starting point and target, and that – again in the figurative sense – is possible only in quantum physics, which is a world where a quantum-mechanical event can be both cause and effect, or where a cat can be simultaneously alive and dead, as Erwin Schrödinger illustrated in his 1935 thought experiment. To analyse your own brain you'd have to step outside of yourself and consider yourself as an object – in other words, you'd have to detach yourself from your own thoughts and their physical location, the brain, in order to determine what's actually going on. The consequences would be death or madness. Maybe even both at once.

As hard as you try to look into your own brain, no technology, no matter how ingenious, will make it possible to watch your own mind at work. Brain waves can be measured, synaptic activity documented. But their relationship to thought remains largely a matter of interpretation. For the time being, then, we have to content ourselves with observing our speech, our decisions and our behaviour as the expressions and consequences of thought. But in doing so we're merely drawing inferences from modes of behaviour, believing that they indicate a particular state or activity in the brain.

An intelligence test, for instance, uses established standards to determine how "clever" a person is – how well their brain works. This is based on social assumptions, and these are dependent on the era and social environment that produced them. Is a person with an IQ of 125 really cleverer than one with an IQ of 110? Do these numbers actually reveal anything? Intelligence isn't "what is measured by intelligence tests", as the American psychologist Edwin Boring said in 1923. Rather, an intelligence test is an attempt to pin

down a quality that largely eludes analysis into something measurable and comparable. It's a social measuring tool, a currency in which the value of cognitive capital can be expressed. In the language of sociology it's thus a second-order observation, one we can use to identify the distinctions we make when we try to observe and measure intelligence.

As things stand, the brain can be explored in terms of its biological and neuronal functions – but as the locus of thought it remains a black box. So perhaps it's helpful to wade straight in. That doesn't mean penetrating our own minds; rather, it means creating a situation in which we can observe how neural activity differs from activity in other, everyday situations. To shed light on the darkness of our brains, we must venture first into the dark. This is what I have attempted to do.

Nothing: No Light, No Sound, No People

One sunny day in August I spent twenty-four hours in a darkened, soundproofed room. The room is on the second basement level at the Zurich University of Applied Sciences in Winterthur. I found it while researching interference-free testing spaces for technologies and devices. This is exactly what I wanted my little experiment to be: a test of my brain in a stimulus-free environment – a kind of sensory cleanroom.

My contract with the university set out the terms: “As part of a scientifically motivated self-experiment, Frau Miriam Meckel intends to subject herself to approximately twenty-four hours with as few (sensory) stimuli as possible (including total darkness and silence) in our usability laboratory, evaluating her relevant experiences in an appropriate manner.” I had to affirm that I was undertaking this experiment of my own free will. That I could leave the room at any time. On top of that I also gave them my assurance that I would pay for any damage caused to the furniture. Spoiler alert: there wasn’t much furniture to speak of, nor did I damage what little there was.

I drove to the university on that August day and left my car in the underground carpark, reassuring myself that I had a getaway vehicle nearby if I needed to escape the darkness. Two floors below ground level, I was met by the small team of scientists who were admitting me into the room. A colleague of the professor whose laboratory I was using took the time to explain everything in full. Where’s the light switch in case of emergency? How about the toilet? Here, fine. Would it be better to shut me into the room while I’m crouching here in the pitch black? Yes, that would be better. How do I call for help if I have to? There’s no signal in this room, so I can’t make a phone call. I’d have to write an email, because they do have WiFi. I wonder who’s going to be checking their email in the middle of the night, but I don’t ask.

In the space, soon to be a kind of sensory darkroom, are a desk and an armchair as well as two tables set against the wall, where I put down my bag. There’s no bed. I take out both water bottles and the sandwich I’ve brought as provisions. The room is about six or seven by six or seven metres, almost square. My own little universe for the next twenty-four hours. Everything is helpfully close together, the tables against the wall and the two chairs next to them. Once it’s pitch black, everything has to be within reach, swiftly perceptible by touch. I see everything, understand everything, commit everything to memory.

The door is bolted from the inside, and just like that my twenty-four-hour self-experiment is launched. My attempt to converse with my brain and my consciousness. On the table is my dictaphone, set to record. If I really do start a conversation in this room, I’d like to document how it goes. Probably I’ll end up with nothing but silence, I think. I’m wrong about that, as the following report reveals. (I filled out the gaps in my notes from memory the day after the experiment.)

I never thought it could work out like this. That I could spend twenty-four hours in a darkened, soundproofed room. But I can. It’s going well. It’s going even better than I thought. Before the light went out, I kept wondering what I was going to do with all this time. And I felt a jolt of fear run through my body. I mean, I can’t even read in the dark. Well, I could. My iPad is in my bag. I could take it out, open it, and watch the screen light up. It would illuminate the room, at least a little bit, letting me orientate myself and giving me some sense of security. And I could start reading. I could watch a film, gawp at something mindless. Or go online. There’s WiFi here, and they gave me the password. So even in this

dark, silent room in a university basement, I'm connected to the outside world. I could make contact if I wanted.

I thought I'd want to, but I don't. After a period of confusion and acclimatisation, it does me good just being here. It does me good to pay attention to my own perceptions. Because, suddenly, they change. I feel different. My hands and feet, often cold, are now quite warm. I feel the blood pulsing through my fingertips and toes. I hear differently too. I hear sounds that aren't in the room. They're in me, placed very gently on top of the silence. My brain rests them on the silence, making it audible and thus bearable. And I can see, too, even in this blackest of darks. I see plays of light, shapes that transform, I see bright flecks and their shadows, none of which are probably actually there. My brain overlays them across my retinas, making the darkness visible.

And so I sit here, minute after minute passing, and it's nothingness. And the nothingness is beautiful. I'm happy sitting here like this. I don't think about how soon my time in this room is going to be up. I think what a pity it is that it has to end at all. I don't know how long I'd think like that if there were no fixed endpoint. If I didn't know that after twenty-four hours I will be leaving this room again, that somebody will come to fetch me, to bring me back out of this space. That might be another matter. But it's not, and it's good just as it is. It's good for me. I'm thinking differently from usual. In different ways. I contemplate different things. Things you rarely contemplate in everyday life, because then you'd have to tangle with them, you'd have to let yourself step back from the things happening in the here and now, where you have a role to play, things you've got to do, a function. In such situations you can't contemplate things that require nothingness, that require silence, thoughts that misbehave, that have no purpose, that simply signify.

The internet connection remains unused, the gadgets on mute. The world remains outside. Nobody can reach me, and nor can I call anybody, even if I wanted to. I could fetch help if something went wrong. I could write an email: "Get me out of here." But I don't need help. Help arises in the situation; in a sense I've brought it with me. The nothingness in which I'm now immersed helps me. It helps me be closer to my thoughts and sensations.

The light goes, and the darkness comes. It envelops everything in its big black cloak, near and far, beautiful and ugly, loved and hated. Under the cloak of darkness, everything becomes alike. Indistinguishable. You don't know who's who. It's all got to reorder itself, and then the conversation begins. You've got to start the conversation with each one, right from the beginning, to find out who's who. And sometimes one will switch with another, leaving in the darkness in the guise of someone else.

It's a border crossing of a very different order. The moment I set foot in this room on the second basement level of the university building, I crossed from one world into another. I passed from real time into a special kind of time that will last precisely twenty-four hours – one whole day – and bid goodbye to the real, outside world. It's also a border crossing in terms of the senses. They're deprived of their customary points of reference, light waves, noises, everything the brain can process as input. I'm eager to see what my brain makes of this.

Remembering my briefing, I go through the room and my situation once more. The room isn't especially cosy; it's rather austere, a utilitarian room in a utilitarian building. Dark grey synthetic carpet, white paint, two tables placed lengthwise against the far wall, two chairs in front of them, a brown armchair, faux-Corbuser, and a black office chair. A large pane of glass runs across the left-hand wall, taking up nearly the whole width. This is a laboratory, generally used to test pieces of technology under lab conditions. Through the

glass, the researchers can observe what's going on in the room. Today there's no one there; the room beyond my room is empty, locked – I convinced myself of that before beginning the experiment. Nonetheless I am being tested here today. No, that's not quite true: I'm testing myself. I decided to carry out this little self-experiment on condition that no one would watch me, no cameras would be pointed in my direction and nothing would be recorded. It had to be private. In any case, it would be pitch black for the entire twenty-four hours. It's sound- and light-proof. No noises can get in, no daylight. Even if there were cameras pointed at me, they wouldn't see anything. Thermal imaging cameras, maybe? But I don't want anything or anybody to record the intimacy of my darkness.

Maybe it was a crazy decision, this attempt. Over the past few days I've been repeatedly gripped with unease, maybe touches of fear about what might happen during twenty-four hours in this room. How it would feel, the fact that it would feel like something, but maybe not like something good for me. But that's exactly what I want. I want it to feel like something. To feel myself. To be without distractions from this self-sensing. The friends I told about this experiment in advance looked at me strangely, sometimes incomprehendingly, and asked, "What's the point?" But once I explained, most of them were fascinated.

I'm going to be in this room for twenty-four hours, without light, without noise, without anything. I probably won't sleep here; I'll sit in this armchair or on that chair or simply stand, because walking in the dark isn't exactly easy. I'll simply be here, keeping my brain company as it works. A friend of mine commented, "There are probably laws against doing that to animals." That may be so, but animals don't have the capacity for decision-making that I have. If they're in a room like this, it's because they were put there. I chose this for myself.

In the old days, places like this were called "deprivation chambers", and they were used in psychiatric treatment. Patients were locked in rooms like these to free them from all external environmental stimuli. It seemed to promise therapeutic success. These days, this approach is no longer used. So maybe I'm doing something completely preposterous. But it might be an experience. Maybe even a good one.

I can leave the room at any time, whenever something isn't right, when I'm not doing well or I just don't feel like it any more, I can go. My car is in the carpark, I know how to get back to it, and I can leave the carpark at any time too. How often do I have to reassure myself about that? There's nothing keeping me here but myself. The research team showed me how to get out of the building in case I need some fresh air before going back inside. Everything's arranged, everything's been discussed. Time to begin. We've said our goodbyes. "Tomorrow midday at the latest I'll come look for you," said the research assistant. "Good to go?" she asked. I nodded, standing in the middle of the bare room, then the light went out and the heavy door closed with a rich thud.

I'm standing in the dark. Within a few minutes I think I understand what people mean when they talk about "booming silence". In this room it's so quiet, so quiet that my ears can hardly endure it, that I can hardly bear it. Something inside me screeches; the silence screeches and roars inside me, and I feel stress setting in. On top of that, I can't see a thing. It's absolutely pitch black in here. I'm standing in the middle of the room, brandishing my hands in front of my eyes to make sure I can't see something after all. But there's nothing there. Sometimes I imagine I see the shadows of my hand and fingers flitting past my eyes, until I realise that these shadows are in various places at once, that they stay still even when

I move my hand, and that they must therefore be the spawn of my imagination, of my desire to see something, not part of the dark reality of this chamber.

I made a mental note of where the chairs were. Slowly I fumble my way in their direction, keeping both arms outstretched, trying not to bump into anything. The tip of my left foot touches something; bending slightly forwards, I realise it's the office chair. A little further on is the armchair, and I turn around and collapse into it. Then I kick my shoes off my feet and put my legs onto the office chair. I'm sitting here now in total darkness and silence. There's nothing around me. Not the normal, everyday inundation of the senses. No attack of the informational cavalry with its endless bugle calls. Not a single signal from the outside world. But my brain fires back like a soldier in a blind panic, shooting in all directions out of sheer terror without knowing who the enemy is – or if there even is one.

So I sit in the chair, legs up, ready to drift into thoughts and emotions. Yet after a brief phase of calm, it stops working. My mind races. I consider briefly why it's nice to be able to talk loudly, but then other trains of thought shoot like needles through the first. I think about appointments, about what time it is (although I've only just entered the room), formulate the final sentences of an article I'm about to submit. This isn't getting me anywhere. Real, genuine thought is out of the question. My brain feels like it's suffering from electrical overload. Tiny lights flash here and there in the darkness. I try to follow them with my eyes, to pin them down, but I fail. By the time my eyes reach the point where I think I saw the light, it's gone.

I lower my head to my chest, closing my eyes. It's remarkably helpful. Everything calms down somewhat. As though my eyelids were curtains I can pull down to temporarily separate the internal and external worlds. As though my eyelids were a slipcover I could put around my brain to protect and enfold it. Maybe that's what they are – but since it's pitch black in this room, there's nothing to protect my eyes and brain from. Yet something does change. Presumably my brain has learned that eyes closed and eyelids lowered means quiet time. Most crucially, it cuts out visual stimuli. And because my brain has learned that evolutionary lesson, perhaps because it's actually genetically determined, I can feel it take effect. With my eyes closed it's quieter inside my head, although outside everything is silent; my mind's eye is calmer, although in this darkness there's nothing to see.

It helps. My thoughts are moving more slowly, but I still can't hold onto one of them for more than a few seconds. My brain needs a handrail to cling to, something it can use to fumble along hand over hand until it gets more accustomed to the room, the surroundings, the situation. I imagine my calendar as a handrail. I go through the days, beginning with the next day, Tuesday afternoon, by which time I'll be out of this room. I go through all the things that will happen, that could happen, that I might want to do, running through my appointments over the following days, on Wednesday, Thursday and Friday, and I realise that this structure is helpful right now, although it's hardly what I imagined my thoughts would be like – what genuine contemplation would be like – when I went into stimulus-withdrawal. My brain and I, we need time to get reacquainted under these new conditions.

At some point I must have briefly gone to sleep. Darkness is tiring. When I wake up, I get the sudden sense that I was watching something on the far wall. As though there's a large screen, its brightness dimmed, where figures are wandering to and fro. All of it is drenched in shades of dark blue, dark violet and dark red, somehow unreal. But I can see there's something there, and then suddenly I realise there are shadows walking around in front of the screen. Now I sit up a little in my chair. I'm genuinely slightly afraid; I'm

confused, wondering whether there's some adjoining room in which people are wandering up and down.

Can they watch me in here? Film me, even, as I sit in this room, making myself look like an idiot in this darkness and silence, trying to orientate myself and regain the upper hand? I stare at the wall, at the spot that looks like a screen shining down on me, and then abruptly it's gone again. There's no more screen, and I see nothing at all in the profound darkness. Yet after a while, slowly, very slowly, another dull, distant, very diffuse spot of light appears. And now I really start to wonder: is there something there, or is my brain playing tricks on me, using its imaginative powers to project something before my eyes or into my eyes that doesn't actually exist outside my head?

I stare at the wall. Feel my eyes open wide, feel how this fixed stare is bodily exhausting, how tense my muscles are, how stiff my neck, how far I am from the state of silent thought I wanted to explore. There's definitely a patch of light. There is something, I can see it clearly. But as soon as I try to focus my gaze in its direction, to identify and recognise it, it vanishes. When I avert my eyes, I glimpse again in my peripheral vision, in the area where I can't focus properly, that there is actually something there.

Then suddenly I'm seeing green lights, strange shapes that light up, small stars and then, in the middle of my field of vision, a blue dot. When I try to focus on the blue dot, it's gone. What am I seeing? I'm eager to find out, because I can feel it's making me uneasy. I think I ought to stand up, that I should try to reach the table next to my chair with my right hand, grope my way along it to the wall, then feel my way across the room so I can properly explore the opposite wall again. I think that – and I do nothing. I sit there as though paralysed, as though I'm glued to the chair, and I realise I can't move a muscle.

I should go over there, I should investigate that wall, I should get to the bottom of what I'm seeing, what kind of light is disconcerting me like this. But then I'd have to get to my feet and take those few steps to reach the wall, try to peer through it again from close up. Seems difficult. I sit and sit and sit, occupying my mind with thoughts of walking step by step along the table, along the wall, across to the other wall, and looking. And I do nothing. Is this the first manifestation of the strange torpor that overcomes the body in total sensory deprivation? Or is it the overreaction of a body that is beginning to feel cold, to freeze a little? The hairs on my arms stand on end, and still I do nothing. It must be twenty minutes, all told, before I finally decide to take those steps, those steps across to the other wall. Or maybe only two, but it seems to me like twenty.

At last I rise from the chair and fumble my way along the table, along the wall, until I'm standing at the other end of the room much more quickly than I'd thought – it seems smaller than I remember – and I put two hands against the wall, trying to work out what I'm seeing. And I see a glow. Or I think I see a glow, but it too stays diffuse. It's not a big screen, in any case, no people walking to and fro, like I saw before. I simply see a glow on the wall. And so I stand there, wondering if there might be someone on the other side. That would be horrible. I hope very, very fervently that that's not the case. That a shadow doesn't suddenly flit through the glow, because it would frighten me out of my skin, and because I'm not sure whether I'd be able to stand the room any more or whether I'd instantly switch on the light, dash outside and find out who or what was there. But nobody walks past, nothing happens beyond the wall.

I think I've been staring at this strange light for hours. By now I feel as though my eyes are lit from within by two rings of light. Like vanity mirrors in hotel bathrooms. Why that is I don't know, and no matter what I do they won't go away, not with my eyes open or

shut. My eyes glow from within, while all around me is dark. And through these rings of light within my eyes I see another light. As I keep staring, around it emerges a starry sky. Stars that light up and vanish, that flicker and disappear once more. And the light itself forms peculiar shapes. Again and again I spot an elongated dot of green, and several times it appears as though there's a lift behind the wall, moving upwards, the cabin vaguely and indirectly illuminated, in which I even think I see the occasional outline of a human being. The lift travels, beginning somewhere on the ground below and moving slowly upwards. And the more I follow it with my gaze, the further it travels out of my field of view. My eyes hurt. Staring in the darkness seems no less strenuous than staring in the light.

By now I'm sitting back in my chair. It doesn't help. There's nothing there but the wall. Everything else I'm seeing has sprung from my imagination. My brain is working with twice the energy, as though it has to compensate for the lack of stimuli. As time goes on, it doesn't get used to the silence and the dark. It gets hyperactive. As though my synapses are firing themselves into a state of imaginative intoxication. In fact, that's more or less what I'm experiencing. Intoxication. Except without the drugs.

My ears, too, are playing little games with me. When I stare straight ahead at the wall with the plays of light, I hear a buzzing sound in my right ear. If I turn my head ninety degrees to the right, the buzzing stops. If I turn my head back to the left, the buzzing starts up again. To me that seems like proof that there's a noise – evidently I can only hear it when my head's at a certain angle to its source. Which is nonsense, because there are no noises in this room. Only the ones I'm making myself, in fact or in my imagination.

It's certainly odd, sitting deep in the basement of a deserted university building in the middle of the night. There's no one here except me. So I think. Think? Hope? Which is the better feeling? That I'm alone here in this building? That somewhere nearby there's a person I don't know about? I contemplate this – for minutes, maybe, even hours. And at some point I reach the firm conviction that I'm trapped inside a mine. I'm not on the second basement level of a university building. The mine is all around me; I can hear and sense it. Occasionally there are vibrations, soft quakes that must be from them drilling into the rock. And then I hear, too, the drill biting into stone with a dull, gnawing noise. All quite far away, very indirect, but I hear it. From time to time there are little explosions, not exactly loud themselves but clearly audible, then everything in the walls around me cracks.

"Herr X is a polite man." That's how I could begin the article I still have to write. That could be the first sentence. "Herr X is a polite man." I've been thinking this sentence for minutes. This sentence, repeatedly. I'm not thinking this sentence, my brain is thinking it. My brain is stuck in a time warp with this sentence. It feels as though I'm speaking internally in capital letters, each letter drawn out, each letter with its own emphasis. "HERR X IS A POLITE MAN." On and on like that. At some point I scream the sentence noiselessly through the room, over and over. "Herr X is a polite man", "is a polite man", "a polite man", "polite man", "man".

I lean forwards in my armchair – I took my feet off the office chair ages ago, because the relaxed posture was so ill-suited to my mood – and rest my elbows on my knees, putting my hands over my ears. No, I'm squeezing my head with both hands. I'm squeezing my brain, where that bloody sentence has got stuck. "Herr X is a polite man." I squeeze my brain until I've squeezed out that sentence. At some point I rest my head on my knees, exhausted, my arms hanging left and right, my hands touching the rough carpet. I stay huddled in this position for a while.

At that moment, or so it seems, the number 18 line passes over my head. Two floors above me, it comes rattling down the tracks. I recognise the noise exactly, the intervals at which its wheels clatter over the sleepers, its bright, quiet squeak along the rails. It's journeying to Istanbul, not Klettenberg in Cologne, but that's definitely it. And then I hear the chiming of bells. The way I always hear them at home in my apartment in St. Gallen, on the hour; now I hear it too, the dull, soft, altogether distant peal of bells. Are there really bells? Is something or someone ringing? Or is it all happening in my imagination? And across the utter silence with its strange undertone of sound comes a high concert pitch, a kind of whistle, gentle and yet somehow shrill. Is it really there? Or has this shrill note arisen in my brain as a way of countering, a little, the total silence? I find no clear answers.

No movement in my face for an eternity. When does it usually move? Usually we're in perpetual motion, constantly stirring, our bodies but also our faces. It's not just when we speak or when we're with other people, acting and reacting, but also when we listen, observe, simply sit. There are no motionless responses. We're always doing something with our faces. We knit our brows, raise an eyebrow, bat our eyelashes, frown, smile or let the corners of our mouths droop. There's always a reason to press our faces into action, our facial muscles – the small, delicate ones and the big ones at the jaw and temples. Not here. I sit here unstirred by any impulse. Unmoving. I'd love to know what would happen if suddenly, without any warning, a flash of light cut through the darkness and a photograph was taken of my face. How would I look? Like myself, or like a stranger? Calm or mask-like? A zombie of deprivation?

Lana Del Rey sings, "Lost but now I'm found" (which song is that again?). She sings very beautifully. I sit in my armchair and enjoy the sound of it. My eyes wide open, I stare into the darkness and hear Lana Del Rey sing. A caravan moves in silhouette from right to left across the room, the figures black, the wagons, all barely discernible against the grey undertone. I sit and look and listen. I've been sitting in this chair for three hours, maybe. Or five? Or even longer? I've stopped wondering whether I've gone crazy. It's a done deal. I simply watch what happens. Dark footprints stride along the wall, first in one direction then the other. Someone above me is running a bath. Who takes a bath in the middle of the night at a university?

What if they forget me here? Then I'll just leave.

What's happened now? I'm lying in a ball in a corner of the room. As though nestled against the wall. As though nestled into the wall. There was something. I fell over myself. Because the questions were so difficult, so difficult to answer, but also so difficult to bear, simply because they were posed. And the whole time I've felt like I'm being watched, maybe even filmed. There's somebody behind that wall. Not just a faint, diffuse light that takes on various forms, that wanders to and fro, shimmering sometimes white and sometimes green. There's someone operating a device, recording what I'm doing here. At some point I was convinced there was somebody there. And I went over again, placing both hands on the cold wall and calling, "Hey, is anybody there?" And then I called again, shouting louder and louder. I started beating against the wall with both hands, and I kept shouting. "Put the light on!" "Show yourself!" And I kept hammering with my hands against the thick, solid wall. And nobody showed themselves and no light went on, except for the weak, dully smouldering glow that persisted in that room. I kept drumming my hands against the wall, shouting, screaming at the imaginary person, at myself – "Get out of here!" "Enough!" "Get out of this room!" – screaming and battering and drumming, on and on, until I was utterly shaken.

And now I'm lying here, withdrawn into the corner, withdrawn almost into the wall. There was something else. I think I heard something. I heard someone fiddling with the door. The door is locked, but I'm not locked in – I can leave at any time. No one other than me is in the building. During the day there were lots of people here, but not any more. I know that. But there is something, there is someone. Slowly, softly, I hear the door handle move. Pressed down, and then I hear the door silently open. I don't know how, because it's silent, but I do hear it. Maybe it's more that I sense the door being opened. A slight change of air in the room, perhaps, a tiny draught, an exchange of oxygen and other elements that I can sense. Either way, I know the door to my room has just been opened. I stare into the darkness, and my ears stare too. I wait for what's about to happen. I scarcely breathe. I feel someone in the room, someone moving quite slowly and quietly and also cautiously. And he's moving towards me. I'm lying in the corner, withdrawn against, into the wall, and it's like I'm frozen solid. And then there's a jolt, or I shake myself and sit up and crawl on all fours towards the person who is also making straight for me, until my head collides noisily with the door, the door that isn't open but closed. I met no one on my crawl. So I sit with my back to the door, lean my head against it and take a few deep breaths. Maybe I just fell asleep for a minute, maybe longer, and I dreamed. This is a sensory and emotional rollercoaster. My brain is my right mind. My brain is driving me out of my mind.

A small child is running on the horizon, just a dot at first, then growing slowly bigger. The child is me. I'm maybe two years old, running clumsily, all my limbs outstretched as though I've got to keep my balance. I'm wearing a small dark-blue knitted dress with a white-and-orange-striped collar and sleeves. On my head is a little straw hat. Both my arms are spread parallel to the earth as I run, and there's a red plastic bucket hanging from the left one. I'm running towards the camera. There's a photo of that scene in my childhood album. Is my memory my memory or is that photograph my memory?

I keep running towards the camera, ever closer, until my dark-blue dress nearly touches and blocks the lens. Then I run past myself.

Are there any air vents in here? You can't hear anything. I breathe and breathe and breathe, and at some point it will be gone, the oxygen. That would be a turn-up: test subject suffocates in the dark.

Wake up, get up, make tea, shower, comb hair, drink tea, dress, brush teeth, do make-up, eat something, read the paper, wake up, get up, make tea, shower, comb hair, drink tea ... and so on. Isn't it pointless, doing something once then having to do it over and over again, beginning something then repeating it until some indefinite future point, or at least not until a point you've defined yourself?

White, waxen faces lie down in front of me. I touch the skin of my cheek with my fingers. It feels like always. People are so vulnerable. A hand can squash us between its fingers, a falling piece of paper can split us, tear or smash us, we collide with the world, with other people, with technology, with ourselves. A needle pricks the blood beneath the skin, a finger rots into blackness and disintegrates. Some images are painful, even though they're only images.

At some point in the early morning, I feel fear creeping up. I don't know which it is, the acute kind, the subliminal, the nocturnal, but I sense it creeping up on me. Maybe it's just the blue hour, when everything is difficult, where problems always seem bigger than all their possible solutions, where you wake abruptly, your eyes popping in the darkness, believing that you'll never get it all done. By now I'm exhausted, and probably drowsy; but sleep is out of the question, and I'm hungry. As always, I've brought too little to eat, not considering that

the body might burn energy differently when it's kept awake all night. Now my stomach is a pit, and fear creeps in – it's easy, because nothing else is there.

What's it like to scream in a soundproof room? Cautiously, I try. Tender screams, a paradox, more of a squeak. It sounds ridiculous, alien. I don't dare scream more loudly; I'm afraid the scream will break not the silence but myself.

Above and to the right, in the corner of the room, an elderly married couple are waving at me from a window of light. I've never seen them before. They're smiling. A double suicide. Both shot. At that age? They keep waving persistently, and at some point I wave back in the darkness. "One of them shot first themselves and then their partner." I said that once on the television news. After the broadcast we had lots of calls from viewers who wanted to inform us that it couldn't have happened like that. It was the wrong order.

Do you see me?

It's black as pitch in here.

You can't see me?

How am I supposed to see you? I can't even see my hand in front of my face.

You can't see anything at all?

Nothing. Nothing at all.

It really is pitch black in here.

Yeah, that's what I just said. What's with all the stupid questions?

You know, you might be able to see something after all.

You mean, in my imagination?

For example.

True, there are lots of images.

You see.

C 97. Caesar 97. Cecilia 97. Catherine 97. Code 97. Three more and it's a round number. Code 100. Wonder how the car is getting on? Capitulation 97. Are there parking spots labelled K in the garage?

I'm sitting in the car with my father, me in the passenger seat, him steering the minibus. We drive very slowly up an extremely narrow street; the bus barely squeezes through. I see a man running towards us. He's approaching from the front, coming down the street. He's running very quickly, and suddenly I scream, "Get out, we've got to get out of here!" The alleyway is much too narrow to turn. My father has to reverse out. I watch anxiously as he steers the vehicle backwards, glancing ahead at the man running after us. Just before we emerge from the alleyway, he catches up with us. He reaches for the windscreen and tacks something to it in one powerful sweep. Then my father reverses a little more and we're back on the motorway. "Not too bad," says my father as we drive down the motorway. I nod, and my gaze falls on the object the man tacked to our windscreen. In a panic I roll down the window, reach around the pillar and tear the thing off the windscreen with all the force I can muster, tossing it behind us in a high arc. "Leave it," says my father, "it doesn't matter." And at that moment, watching in the rear view mirror, I see the motorway explode behind us.

What was that? Did I make that up? Did someone else make it up for me? Did I fall asleep? Was it something I once dreamt, and now I'm remembering it? Why now? And where have the images of this film come from? Where were they filed, where stored?

In the silence you can listen to the time passing. And because you can't see it go by, you always feel like you're in step with it. In the dark you can watch images materialising in the space. And because you can't see where they come from, you're one with all of them.

Enough of Nothingness: More Light

At some point, quite abruptly, I felt it: that's the lot. That's twenty-four hours gone by. I didn't stop to wonder whether my body clock was deceiving me – I'd had enough. So I groped my way over to the door and switched on the light. It took several seconds before I could see again, more or less. When I looked at my phone, twenty-three hours and twenty-five minutes had gone by. I didn't have the energy for the remaining thirty-five minutes.

In many respects what I experienced was like a conversation with my own brain. Not that I knew exactly what I'd got from my brain or what my brain had got from me. Not that I'd always felt it was a friendly conversation. For periods it was more of a battle, in which one of us felt to the other like a kind of extra-terrestrial. The most immediate part of the experience was confirming that I can't observe my brain myself. I can experience things with my brain that hint at what it's capable of and how it's connected to me. Yet in doing so I always remain a participating observer. When I manipulate the conditions under which my brain works, I'm also manipulating myself.

It was more than a day before I could see clearly again. My short-sightedness had seemed intensified by a diopetre in each eye by those hours of total darkness. I had packed up my few belongings, walked down to the carpark, got into my car and driven home – without accident, luckily. Along the way I stopped briefly at a petrol station to buy a sandwich, then back home I went straight to bed and slept for a few hours as though anaesthetised.

Those twenty-four hours were a road trip through my brain. An experiential journey that showed me what magnificent and also alarming faculties are contained within my head. Depending on your situation and personality, sensory deprivation can call forth either a friend or an enemy in your own mind. My twenty-four-hour trip gave me a feel for how all sensory perceptions, all memories, my powers of imagination and fantasy, as well as emotions spanning jubilation to panic attacks, are anchored in the brain. Incidentally, the Lana Del Rey song that ran through my head in the darkness is called "Born to Die". And the strophe that my brain played backwards and forwards like a mixing console goes like this: "Lost, but now I am found. I can see, but once I was blind."

Now, I'm not the first to do an experiment like this. Others have attempted something similar. One famous self-experiment was undertaken by the psychopharmacologist Ronald Siegel at the University of California in Los Angeles. In the mid 1980s Siegel got into a flotation tank, which is a tank filled with saltwater. Inside it wasn't just dark and silent; Siegel's body floated in the saltwater as though weightless. The result is almost total sensory deprivation. Siegel's experiences, described in his book *Fire in the Brain*, are similar to those of many other experimenters as well as my own. One example from his notes: "In the distance a tiny pink pearl materialised. As I got closer I saw that the pearl was a miniature Buddha [...] He was holding a pink balloon that read "I am them." The Buddha started laughing at me, holding his sides as they expanded with each new chortle and gasp. Then, with a magician's flip of the hand, he produced a shiny golden needle from behind his ear and poked himself in the navel, exploding in a burst of thunderous white light."² An actual LSD trip wouldn't get better than that.

Siegel's ideas have since found enthusiastic imitators. In the 1970s many researchers still had problems financing their first studies on the effects of sensory deprivation on the

² Ronald Siegel: *Fire in the Brain: Clinical Tales of Hallucination*. Dutton 1992, p. 6.

brain. This is just a passing fad of the hippie era, argued funding bodies dismissively. Yet today there are a significant number of scientific studies and, in the USA, two-hundred-and-fifty centres that offer floating as a form of therapy.³ Patients float in a salt solution for between forty and ninety minutes. After several sessions, depression, anxiety and pain are significantly reduced. The treatment also improves quality of sleep and the general psychological state of the “floater”. It seems to be a good idea to occasionally deprive the brain of the stimuli that constantly surround and affect us day in and day out. But this deprivation is best in moderation: the brain operates on the basis of a balance of stimuli, most of which it produces itself. Deprive it for too long, and the brain gets nervous. It recognises that normal sensory stimulation had been suspended and responds by becoming hyperactive, recreating it. This is what produces visual and auditory reflexes, whole worlds of images, even hallucinations. The brain is trying to compensate for the outside world’s shortfall by creating its own inner world.

As yet, neuroscience cannot explain all the details of what’s going on. But floating seems to have a similar effect on the brain as meditation. It’s clear that meditation activates the centres of the brain responsible for attention and focus. This works better with people who have a lot of meditation experience than with beginners, but the fundamental takeaway is this: it does work. Conversely activity is inhibited in the amygdala, the area of the brain responsible for conditioning fear, which initiates the “fight-or-flight” response in humans. Meditation has long been used therapeutically to counteract mild forms of depression and anxiety, or as a way of combating high blood pressure. There is thus a wealth of evidence pointing to a connection between thinking and feeling, between the psychological and the physical condition of a human being. Altogether it suggests a guiding principle for any expedition through our grey cells: leaping blindly into experimentation on the brain is not a good idea. This insight may sound banal, but it’s one we shall find in many different places, far beyond darkened rooms and flotation tanks. Yet daunting as such experiences may be, the human impulse to measure and improve the brain knows no bounds.

³ <http://time.com/floating/>