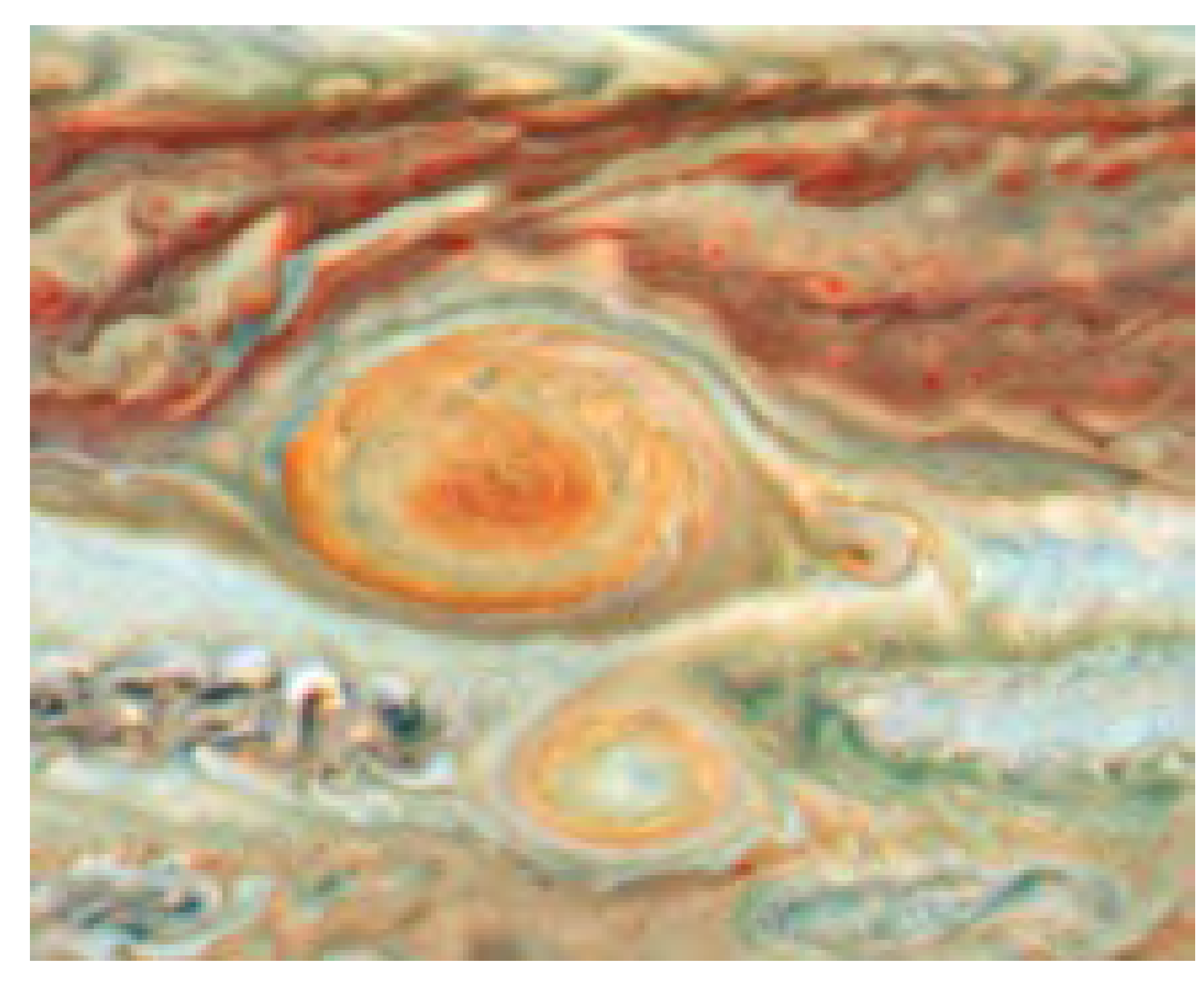
Here be dragons

making detours in uncharted territory

This paper talks about gardening **(0)**, steam engines **(12, 14)**, boats **(13, 14)**, trees **(11, 15, 16, 17, 19, 23)**, bricklaying, **(18, 19, 22, 27, 33)** roadsigns **(23, 24, 25)** and more. **(27)**
But more important than *what* it talks about, is *how* it came to be talked about.
While writing I tried to explore how to write a thesis. **(37)** How does writing work? **(2, 3, 4, 5)** How do I transform *turbulent* thought into *linear* text? **(1)** Is transforming and making the same thing? How does making things work? And what do I make then? Is making just changing the state where a material exists in? Doesn't matter already change by itself? **(11, 12, 13)** And if so, why do we interfere? **(14)**
In this paper I distinguish two approaches to making; *tracing* and *mapping*. **(32)** When you already, before you start to make, know what you are going to make, most likely you will be tracing. When you would want to draw somebody's portrait, you will follow and trace **(36)** the lines of their face. When you want to make a steady table from a tree, you will follow or use techniques **(15, 16, 17, 18)**, utensils, rules or methods in order to help you to make *that something*.
Writing does not only organize my thoughts, it's method also provides me with a productive path of action **(15, 16, 17, 18)** that helps me transform my thoughts into something working, something useful; something that can be traced by somebody else again is a *working image* **(21, 32)**. To go somewhere, rather than anywhere we need to somehow plan a route. **(23)**
A good or finished map, text, road sign, product or utensil are all in equilibrium, stable, reliable, blackboxed, encased, territorialized **(16)** and representational **(29, 30)**.
We *skillfully* **(22, 25)** use somethings to trace action from but also trace action back on them when we ourselves make, assemble or construct. Tracing both starts and ends in with something in equilibrium, something working.
We navigate **(24, 26)** our way trough the world, by deducting meaning from the things that *work*. We define our position by placing ourselves somewhere close or distant in relationship to a *working image* of choice.
The other approach is mapping, which works comparable to making doodles, sketches, drafts, try outs or brainstorms. Rather than stacking and inscribing **(19, 33, 35)** actions to reach equilibria, mapping is turbulent. It never reproduces and represents already existing things, but explores, experiments and improvises to look for the new and uninvented. **(34)** The path of action organizes itself **(36)**, simply by reacting on the intrinsic qualities of the things it comes across, rather than being lead by some kind of superior decision making centre. Mappings don't reach for goals, they don't go somewhere, but anywhere. They make *anything*.
A finished mapping can look exactly the same as a tracing **(36)**, but does not work the same. Mappings aren't traceable, they make sense nor point. And thus we cannot use them to navigate ourselves from. (A world map is never made by mapping).
Does this mean, that there is only a place in the world for somethings? For things that function, that work, that represent and reproduce *somethings*? Is there no space for *anythings*? For things that are not finished, **(38, 39)** that do not work by themselves alone, things that are or could become a multiple rather than a definite? **(18)** Can I only define my position in the world, by choosing to agree or oppose to something already existing?
Do I have *any* position when I don't want to inscribe myself into any domain, name, or territory? And if I want to call myself, let's say a designer, does that mean that I should define that position by tracing that world and reproducing it, somehow? Clearly I would then only succeed to be a designer, when I would make things that fit in that world.
How can I deal with a desire of making and inventing anythings, without always having a goal and to make things work? How do I explain this desire in a sensible **(38, 39, 41, 42)** way?
In order to say that I don't want to make a point, I have to make a point **(37, 40)** and I order to *actually* make *anything*, I have to make *something*.

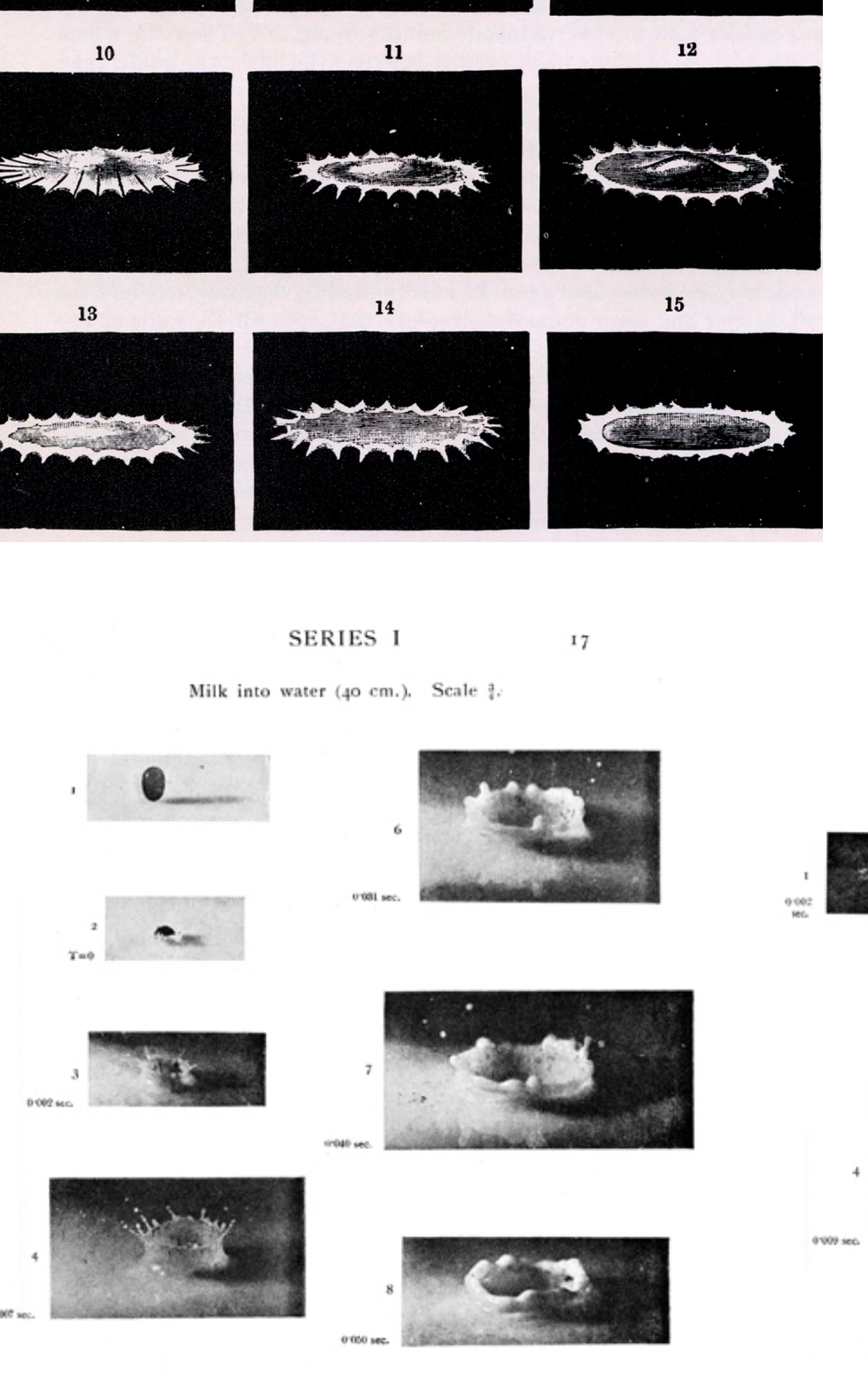


A f e w w e e k s a g o I helped a friend working in his garden. He has a little greenhouse, that he uses to grow tomatoes, peppers and aubergines. After harvest he wanted to take out the plants.
The pots and soil could be reused so the idea was to take out the plants, possibly with roots, then bring them with a wheelbarrow to the compost, hundred meters away. The pots were to be emptied in a big pile in a corner.
The greenhouse had a rectangular shape and we started working on the same, short side, me on the left he on the right. Some of the plants had sticks in their pots to help them standing up under the heavy weight of their fruits. I only noticed this when I wanted to grab a plant and felt something hard. I saw more sticks and found that they were connected to the stems with a little rope.
In some cases, I could pull out the sticks, without difficulties. I did this with my right hand and I collected them in the left. With some plants it was more difficult, either because there were a lot if side branches causing friction to the pulling process or the little rope was tied so very tight to the stem that pulling did not work. I found out that it was easiest in those cases to simply cut the rope with a knife and pull them out like that.
When my left hand could not hold anymore sticks, I looked around to find a place to put them aside. Then I turned back to the plants and pulled out a random plant that was within my reach. I saw that the upper part of the plant just broke off and the roots did not come out at all, so with the next plant I tried to grab the plant as low as possible, digging in the soil with my fingers to grab it at its roots. That worked better.
I kept on pulling out plants like this, but also pulling out an occasional stick I came across. (The plants come out better when the stick is removed first.) To make my way through in the brown half-dead jungle.
I would sometimes put a an empty pot on top of another one, making place for my feet to put another step on my exploration. After pulling out a certain amount of plants, I came across more and more pots with sticks again, so I started pulling out sticks again and when my left hand was full I pressed them in an empty pot beside me. I pulled another plant, sometimes on my right then again on the left.
At some point I saw my friend was using quite a different technique. His empty pots were neatly piled up along the right wall of the greenhouse, all the sticks were in one corner and the plants already in the wheelbarrow. I looked around myself and started to also organize my plants in a corner. I looked at the wheelbarrow and thought of how many plants would fit in there, I came to the logical conclusion that if I would compress the plants, more would fit in and the less times we would have to walk up and down.
I started stowing the dead plants into sort of balls first, then I tried folding them up. The best way, I found was to fold over the stem of the plant once about 5 cm higher as if they came originally above ground and then winding the rest of the plant around it's roots. At that point I switched between pulling out sticks, plants, folding some plants into little packages and moving away pots, aroused to reach the back of the greenhouse. When all the plants were taken out, we looked over in the greenhouse and smiled because of the contrasting results.
On one side a ravage of pots, sticks and partly folded up and thrown-in-an-corner plants. On the other side rows of neatly piled pots, sticks in a corner and not a plant to be seen anymore.

Lieselot Versteeg,
TXT, Gerrit Rietveld Academie,
Amsterdam 2014

0.
Unexplored territory on medieval maps was often inhabited in with dangerous beasts and (then considered) Mythological creatures. It was the place where scorpions live and serpents or elephants were born. Although the phrase "Hic sunt dracones" has actually only been used twice (more classical was "Hic sunt leones") it became an iconic phrase to illustrate the conception of the unknown to be synonymous for danger.

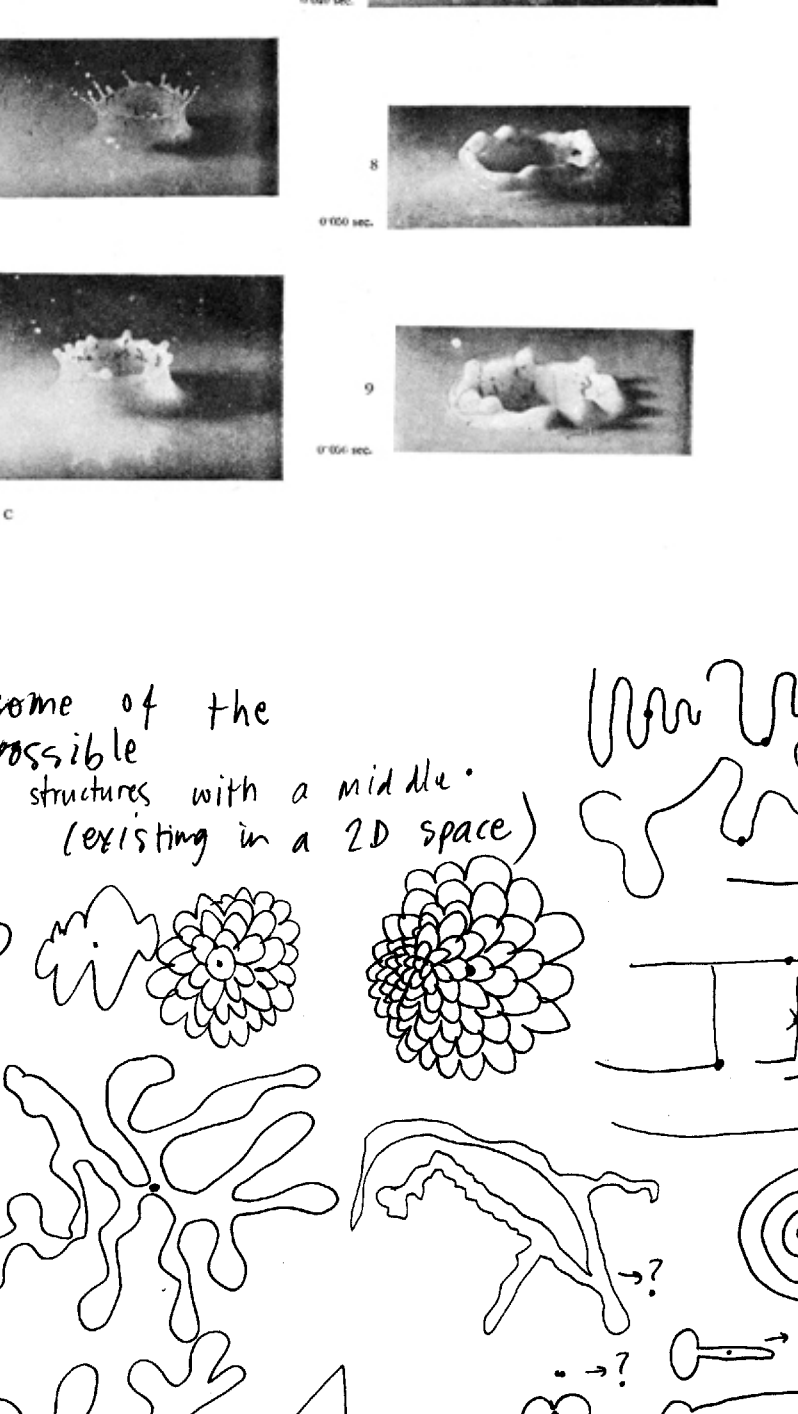
1.
State changing processes
At the moment where thoughts are mere thoughts, they have no perceivable physical bodies of their own. They thrive without having a beginning nor end, it is even doubtful at times if one can determine a middle point.▮ Thoughts we can not perceive *properly* with our sensory capacities. To give actual shape to these kind of entities, to make or to translate them into *something* that fits the dimensions seizable to our understanding, we need to crystallize them, give them an actual shape. We need to define what they are so that we can appoint them properties in relationship to our dimensions. Processes like compression, expansion, acceleration, deceleration, densifying, diluting, heating, cooling down and what not follow.▮●
When I make something, I play an active role in facilitating these state changing processes. I perform the actions and make the decisions that makes anything transform into something.

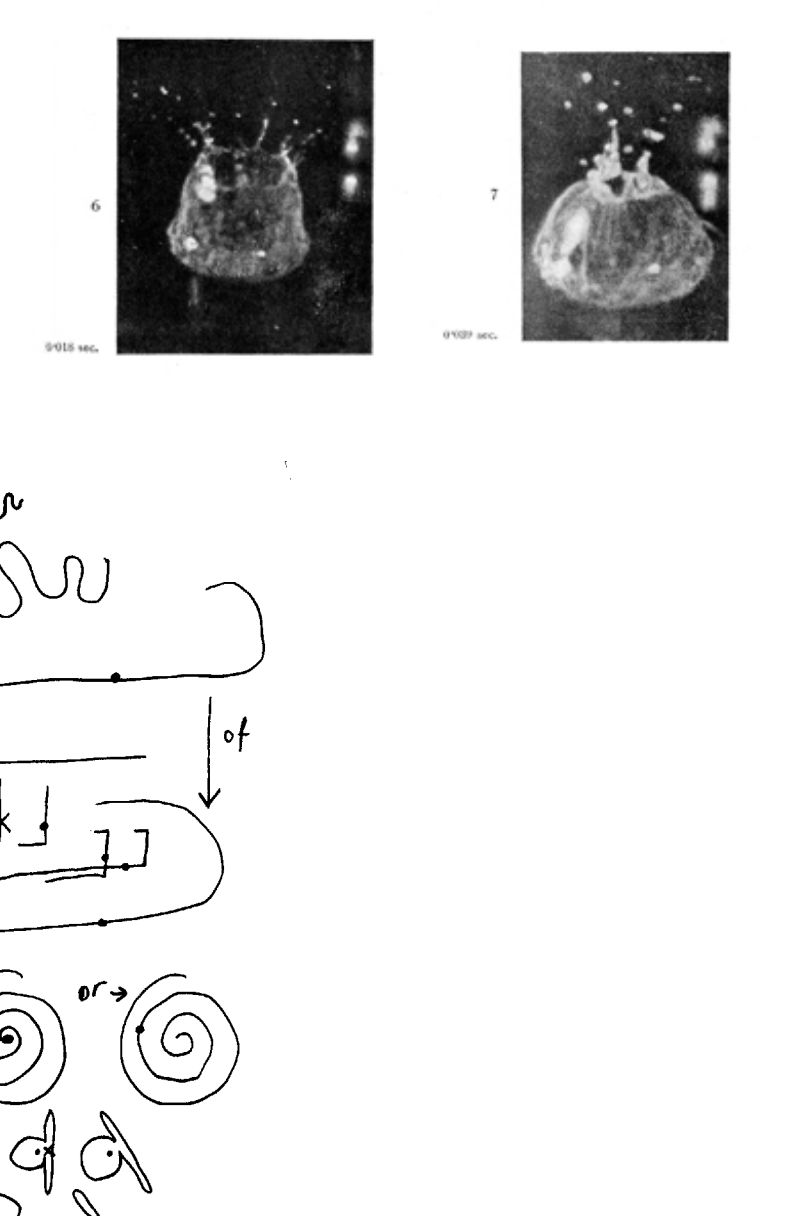


1.
● Drops of mercury on a solid surface.
Arthur Mason Worthington,
A Study of Splashes, 1894.

2.
Transforming
Writing is not simply putting thoughts on paper. It proves to be a little more complicated.● The task of writing this paper, is to transform thought into text. Techniques help us transforming one thing into another. They form a framework for action.
Text, for example, is made through the technique of writing. When we master the skill of writing, we could technically transform thought into readable text. Techniques offer a productive tension between restraining and enabling. It is a system of rules, a method, framework, technique, tool or utensil that mediates between intensity and material.

2.
● *"Writing is a choice of letters to be inscribed on a surface. This choice (like any other), must either have an explanation or no explanation.*
If it has an explanation, that explanation is the discovery of the cause which has determined this choice."
Vilhelm Flusser,
The Gesture of Writing, 1991.

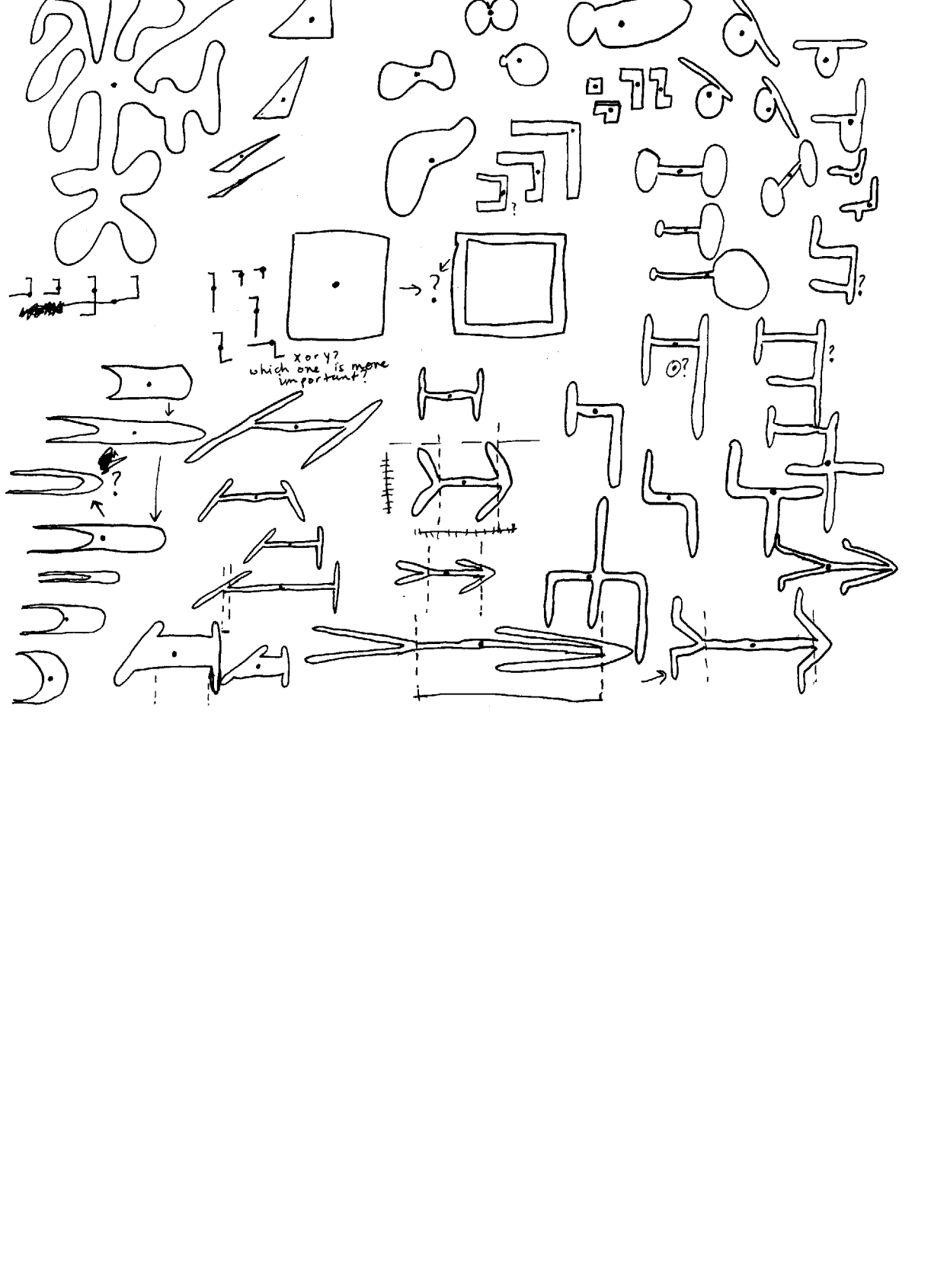




3.
Observing and following
When observing an alphabetic writing, possibly the most important to know is, that these signs have a specific order in which they need to be observed, they are written in such a way that they make most sense when you start in the upper left corner, move to the right and go down a bit, start at the left again. Text has a beginning and an end; it works linear. To follow its consecution, your eyes should be making some kind of zigzag movement.

4.
Specific and generic
One might also find out that text is build up with a small amount of symbols that repeat themselves every now and then. First, they form smaller groups signified by empty spaces between them; words. Then there are bigger groups that are marked by a small dot between them; sentences. Text might contain many of these bigger and smaller groups. There are rules that apply to the combining of these symbols. The small groups of letters will only be understood by people, when they exist in some kind of database for words, a dictionary. Sentences, only work when they are built up by words, following the rules of spelling and well spelled words can be combined then through the rules of something called grammar.
The more steps and rules you follow in order to make the text *work* and be understood the more specific you can write. Whereas the word cat is quite generic (cat what?) the cat already gets a more specific meaning when it is grammatically accompanied by a dog.
By adding words, combining them in a sentence or a group of sentences it is possible to create a more and more precise context for the cat and the dog, making the cat and dog a more and more specific cat and dog.

the dog and cat
the dog and cat are trapped in a cage
the dog and cat are trapped in a cage, lets try to get them out
the dog and cat are trapped in a cage, lets try to get them out, so they can just be the dog and cat
again



5.
Coding
Within the technique of writing, we might be able to distinguish many different types. Although a poem and a scientific paper are both written and they are both text, they are constructed by following quite a different set of rules.
The rules of writing a scientific paper go far beyond spelling and grammar. It's procedure and structure also tends to determine what you say and where you have to say it. It is predefined that letters, words and sentences form 'chapters' called 'abstract', 'introduction', 'methods', 'results' and 'discussion'. Scientific writing has much more rules to follow, than writing for example free verse poetry. The more rules to follow the more coded a technique becomes. The more coded, the more an outcome is predetermined. Where all (excuse my generalizing!) scientific papers tend to look the same, poetry exists in a variety of more different shapes. Writing poetry (some types, till a certain extend) can permit one to invent rules instead, to think of one owns format to write in. Using an accepted format like the one a scientific paper uses, is efficient and helps fighting misunderstanding and confusion. The technique serves as a mould or manual, similar like the Ikea manual does.
It explains as clear as possible how to construct the chair you saw in the shop. Constructing with a manual goes much faster than connecting pieces from a kit by trial and error. Unlike poetry, one might say, writing a scientific paper enables you to focus on the content of what one writes, rather than at the same time also struggling with (finding) a form for it.
We build a chair by following instructions because we want to end up with a stable chair. The scientific paper format is constructed *to function*. A reader who consults the papers, wants to find information in a efficient way. The paper functions to inscribe already done experiments, to report an already done research. The writing traces action and observation and it focusses on laying out clearly organized information, with proper answers and conclusions.

6.
Judgement and homogeneity
When two or more papers are similarly constructed, we can easily start comparing. "This paper is better than that one.", "This paper is a mess, I don't understand anything.", "This paper is weird, it does not make any sense.", "This paper offers better conclusions than the other". Through the interaction of comparable parts, norms or standards are being enforced. A paper with 'bad' conclusions, differs to much from the norm and is thus will probably not be taken in serious consideration, simply done away, ignored or ridiculed. This interaction and judgement works comparable to the social control that happens in tight knit communities; certain norms are being defined by, for example, gossip that highlights properties and events that deviant, are unusual or weird. In order to function properly in a community and to belong to it, people (papers) reduce points where they stick out, where they differ and where they could be 'wrong'; a homogeneous group arises.

7.
Any- or some-
I'm interested in making. I like working with materials and see what I can do with them. More than being concerned with designing products, I'm interested in the design of a process. Asking how something works often gives more interesting insights than asking what something is.
I'm interested in different ways of making, in finding out how making works, in learning techniques and in experimenting with material and tools. The most fun is to invent how something works, or could work.
When I say that I like making, I should maybe be more specific. What do I like to make then? "Anything" seems to be considered a wrong or at least weird answer. I need to position myself somewhere. To what fields do I relate, for example? I should make something. Saying anything, is almost like saying nothing. But saying something is not saying anything else. I cannot make just anything, this is still my graduation! That is not just anything, that is quite something!

8.
How to make
How to make things, without them necessary becoming somethings only, but things which can be more than just that something. How to transform without cutting away too many weird bulges?
Can material organize itself? Is there always a need for externally imposed rules? Is all making done by following a technique? Can I make without rules or framework? Is it possible to construct my own rules, or follow only the rules I *choose* to follow? How to experiment without having to inscribe experiments into all kinds of normative frameworks? Is making defining a path of action, or is it a position, in a space of action? How do I make? How does making work?

9.
Symbolic and behavioural
Artificial intelligence deals with possible approaches to pose and solve problems (and thus studying the invented, or followed *paths of action* in doing so) with intelligent agents such as machines or software. In this branch of computer science Manuel de Landa● finds names and possible explanations for approaches similar to the ones I tried to sketch while describing working in the the greenhouse: symbolic and behavioural based Artificial Intelligence. Symbolic Artificial Intelligence works with representations of the world, it traces some kind of *space of action* and gathers its informations in a central point (the brain for example). Then it constitutes a distinct framework of action, it plans out a set of proceedings; first this needs to be done, then this and then this.
I do something similar often when I wake up; I know I am in a hurry, but really don't want to get up. Justifying to lie some extra minutes in bed but at the same time already being productive, I plan out what is the fastest way of doing the things I need to do before I can leave the house. Behavioural artificial intelligence on the other hand, is action that emerges while encountering expressive qualities of things and while detecting obstacles.
It does not approach a space of action as a whole but rather deals with intrinsic constraints, that James Gibson calls affordances●● (Things that constrain and thus also enable, afford action.)
When my hand is full, it does not afford me to gather more sticks. I need to store the sticks somewhere else, triggering a following proceeding, dealing with other affordances than the previous operation. (What is a good place to store sticks?)
Decisions are not made and imposed from a centralized point but the brain works closely together with other body parts that can make decisions while being in direct interaction with their surroundings. We could speak of a self-organizing meshwork, a decentralized system where all parts have autonomy in making decisions.

9.
● Manuel de Landa,
Homes: meshwork or hierarchy, 1995
●● James J. Gibson,
The Theory of Affordances, 1977

10.
Two approaches
The two different approaches used in the greenhouse, might simply be referred to as planned and not planned. My friend was executing a plan while I started without having an overview of the situation. My approach had an unintended starting point and (although a clear goal) the process organised itself as it went. Evidently I also did not choose to use this approach, it more or less 'just happened' when I started. Is a path of action which is not planned also technique in retrospect? Where there rules I followed while acting?
If so; where do these rules come from? If not; how is decided what (kind of) actions are to be made?

11.
Changing, growing, becoming
Some plants produce woody structural tissue. Soft green parts slowly become hard and brown. Wood helps a plant to stand up by itself and grow tall and it also takes care of the water transportation from the soil upwards.
When I would go and stand in front of a random tree for a while, I would not be able to see its actual growing. It would look like a static object to me at that moment (if I would not know better). But when I would come back some months later, I would for sure be able to determine that it had changed; it got bigger and denser. I would say: "The tree grew."
When we would cut its trunk, we would be able ascertain its age through counting its annual growth rings, the traces of its growth, its history of becoming. Like trees, mountains might also grow (change, shrink?) but too slow to be relevant for us.
Other things again, move too fast, or turbulent. Earthquakes and tsunamis can seem to strike out of the nothing. This is how Gilles Deleuze and Felix Guattari●● describe the world; full of dynamic becomings, rather than static beings. They emphasize that something we perceive as static matter, is merely the actual state of a morphogenetic process which might have a slow speed of becoming. Although our bare eyes sometimes tell us differently, the things around us are changing shape all the time.

11.
●●Gilles Deleuze and Felix Guattari,
A Thousand Plateaus, 1987

12.
Fuel
Movement is intrinsically connected with energy. The sun produces energy for plants to grow and a battery provides your phone with the needewd energy to work. Intensive thinking● deals with determining the 'fuel' of a dynamic system. To do so, it divides properties of things into two kinds. There are extensive properties, such as length, area and volume. Simply said; all things you could cut in half. Intensive properties like speed, temperature, pressure, density and concentration can not be divided by physically cutting the matter in which they occur in two. Intensive properties deal with the state in which matter is in. When changing the temperature of water, it can turn into ice, snowflakes or steam.
When two intensive quantities that are opposed to each other are put in contact they start a flow of energy. The contact between hot and cold air forms the intensive difference that fuels a steam engine. The flow of energy is then made productive by mechanical parts that transform the airflow into mechanical movement.

12.
● Manuel de Landa,
Intensive and Topological Thinking, lecture, 2011

13.

Waiting for wind

When a sailboat travels and commonly it has a destination or purpose. We use the sails on a ship, to tap into the flow of wind and transform the 'caught' energy into something directly useful or productive. But the wind is unpredictable. It has a will of its own and that is not always in accordance with the will of the sailors.
At times the wind is blowing from the right direction, but at other times all stops have to be pulled• to move in the right direction. All kinds of methods were invented to make the wind flow more productive. Sailing techniques finding ways to circumnavigate, to sail against and across the wind (omzeilen)•• but also techniques of making more efficient hardware, like better sails and ships.
Techniques function to make things productive. Using wind as fuel helped the growth and increased the efficiency of overseas trading.
But still the sailboat was depending on the wind and its erratic behaviour. We could not control it and make do what we wanted it to do. On days without a breath of wind, it was simply not possible to sail, anywhere. Where once the forces of wind and earth were worshipped as powerful sources of energy, their unstable potential now started to become a factor slowing down progress and efficiency and become more and more a source of uncontrollable inconvenience.

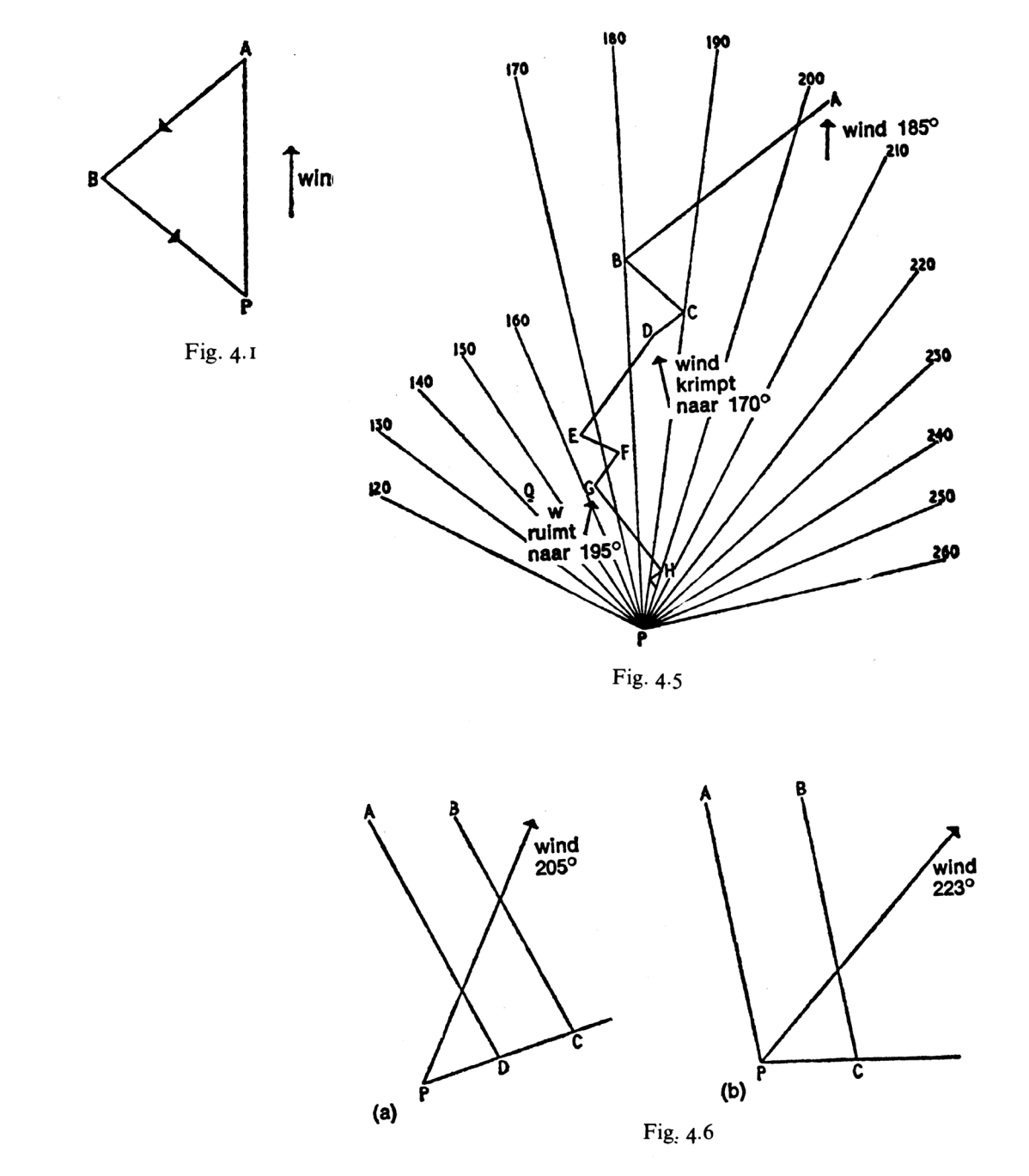
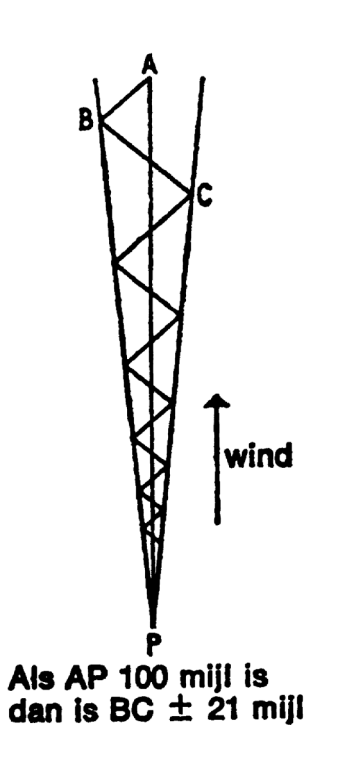


Fig. 4.1
Fig. 4.5
Fig. 4.6

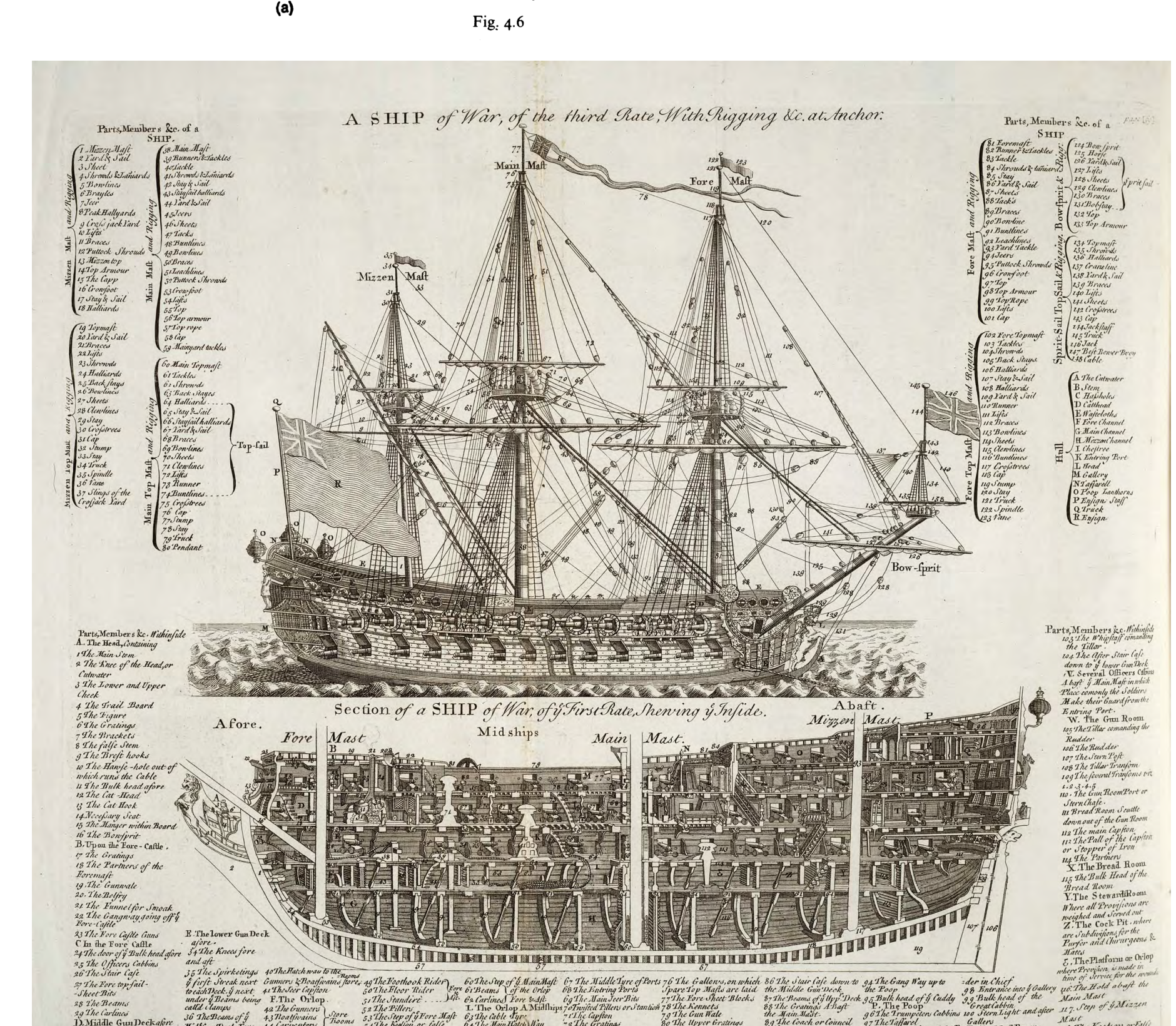
13.
• "...Moeten alle zeilen bijgeet worden"
•• Tacking (zigzagging) into the wind. You can not sail straight into the wind; the sail would flap like a flag. Images from Mary Blewitt, Navigation for Yachtsmen, 1964

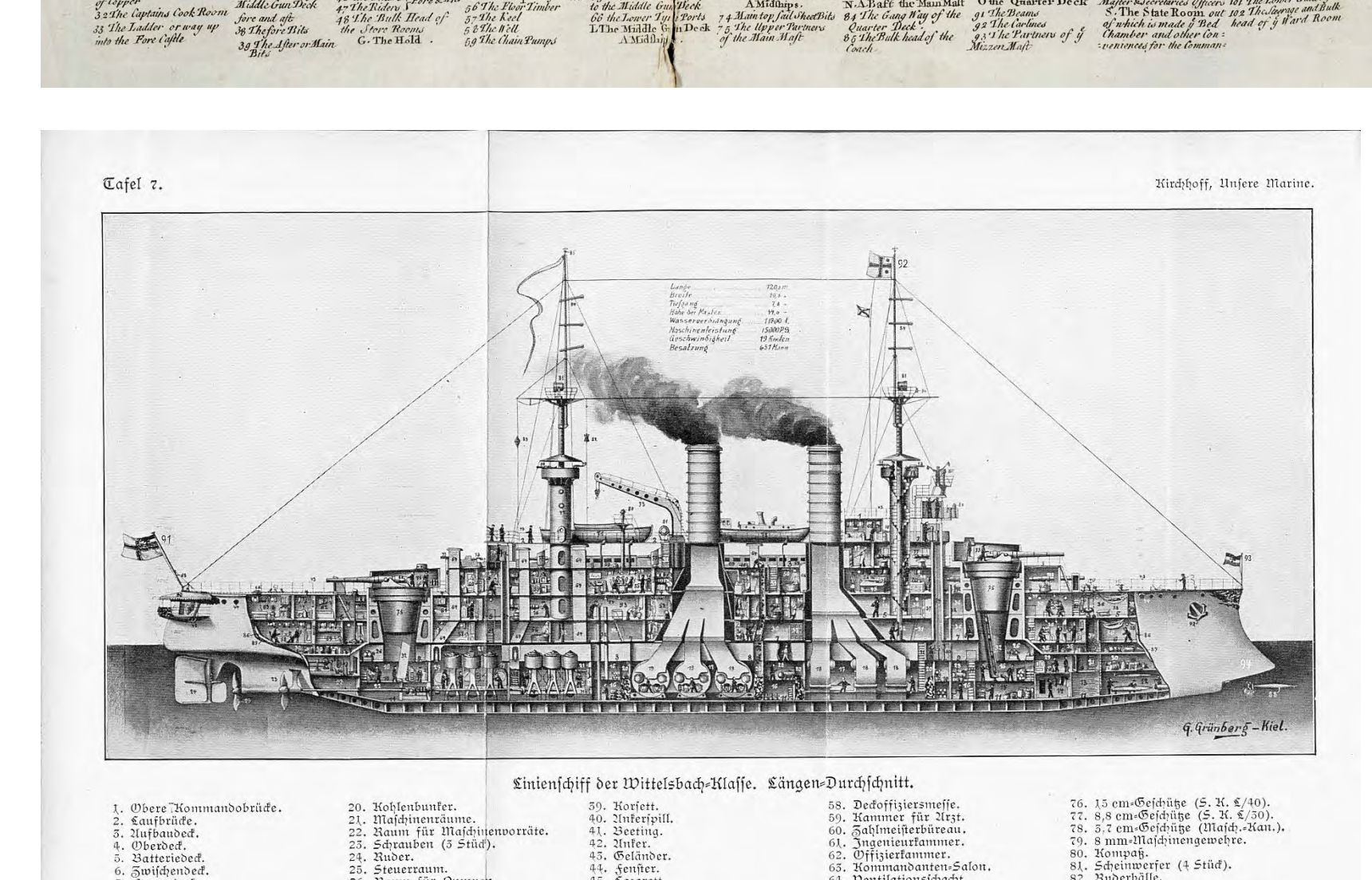


14.

Domestication of energy flows

The invention of the steam engine, put wind in a box with an on/off button.•• In a similar way we domesticated plants and animals some centuries before, in the 19th century we domesticated yet another energy flow and made it a productive and reliable energy system.
Finally it was possible to not only accidentally use the wind, but we could use it where we wanted and turn on when we wanted.
By recreating the conditions needed for a process to thrive, we were able to control its growth and becoming. Sails, waiting for wind to bring them to being got replaced by chimneys confidentially blowing out steam.▪▪
The steam engine provided a stable flow of energy, which we could use efficiently, as long as we fed it, in this case with coal. Uncertainty and improvising with what was available was once again changed into certainty, reliability, habit and routine. Instead of variable and unstable sources used to base actions on, more and more stable and reliable standards appeared. Sailing techniques that always needed a different approach according to the behaviour of the wind, could not be learned from a book. The steam engine produced a stable flow of energy which always asked for the same set of proceedings in order to make it productive.

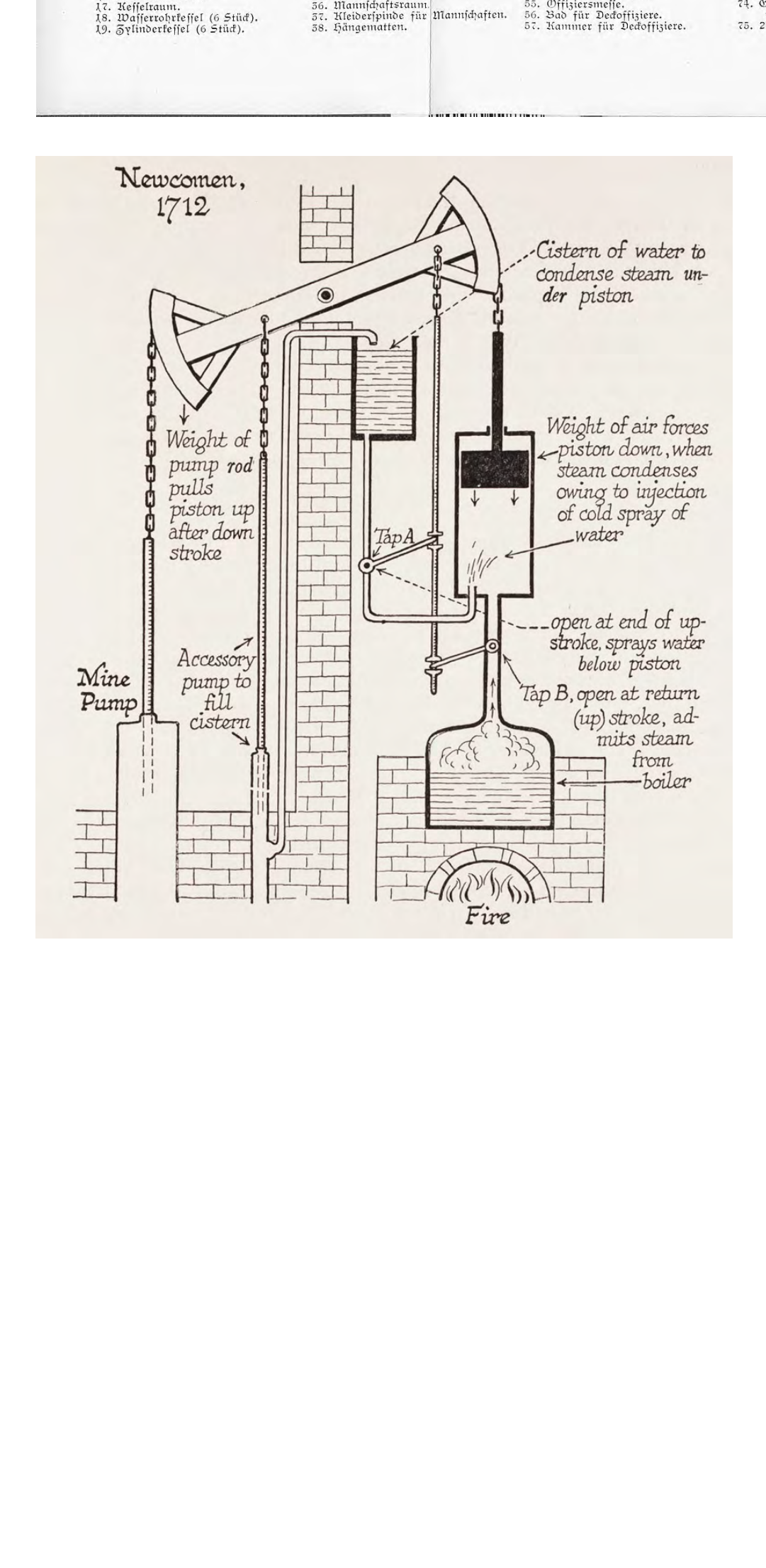




15.

Procedures

Techniques are sets of proceedings applied to things, in order to control their *state-changing* in a productive and efficient manner.
An airflow can become mechanical movement when we interfere with it. Apart from wind we can base our actions on any *becoming*; trees, stones, earth, wind or even on things that we cannot perceive as something material, like thoughts or feelings.
When we would take a tree and perform some random actions to it, it is unlikely for it to turn into something directly useful. To make the tree into *something* rather than *anything*, there needs to be somehow a chain of procedures applied to it that guides the tree towards becoming something specific.
The tree is transformed into a table, by carpentry. Thoughts are organized into text by writing. Making, organizing, assembling, 'creating' or transforming is about distilling actuality from virtuality.
When we do not use it to make a table, we could think of endless other possible uses for the tree. Techniques *actualize potential* from material with possible and *virtual* capacities. When I make a table from a tree, I exclude many other possible ways that body of the tree could be used for. Techniques serve as a guideline to follow within a multitude of possible choices that lay embedded in the becoming of the (im)matter on which the technique is implemented. They help making choices and decisions. They offer a framework of rules and provide us with a plan or a *path of action*.



16.

Reliability

Experimenting on or with a piece of wood is something else than making a table out of it. For a set of proceedings to become a technique, they have to prove to be reliable. They should successfully complete a task; not only sometimes, but always. You can only judge wether something works or not, when you know what it is supposed to do. A technique is a set of proceedings that is designed to perform a task, to reach a pre-set goal in a optimised, efficient and reliable manner. The technique seems to have both planned proceedings and also a planned outcome.
For a technique to work and be productive, they are predicted. This is also how skill belongs to technique; in order for a technique to achieve its goal, not only the proceedings are planned out, they also need to actually happen and be performed properly. A technique can be very reliable, but when implemented poorly, not reach its goal.

17.

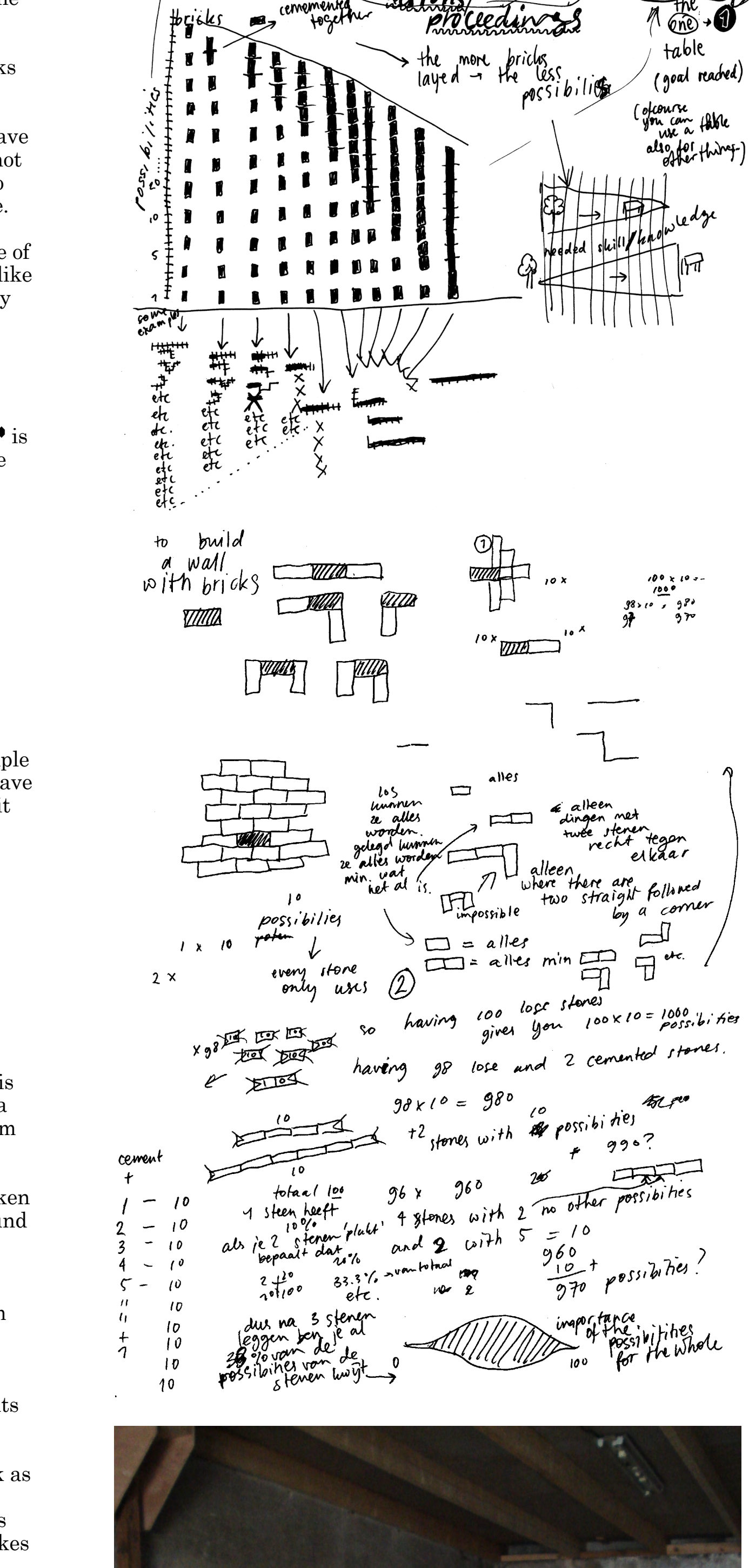
Chains and subchains of proceedings

To transform the trunk of a tree into a proper table, the wood is exposed to a multitude of different techniques. We saw, screw, glue, nail, sand, carve and join. Sometimes, some (or all) proceedings within a technique, make use of a mediator between our body and the material. In the technique of sawing, many proceedings are facilitated by the saw.
A contraption becomes a tool when it consistently proved to work, in the same way a set of proceedings became a technique. Tools are generally designed with a specific goal in mind. There are also tools that are less specific and that can be used for a multitude of different intensions.
We could say that within a joinery technique, there is a 'smaller' technique again which consists out of proceedings applied not to the wood directly but to the tool.▪
To be skilled in joining two pieces of wood, one needs first to be skilled in using a chisel and a hammer.
I can also use screws to connect two pieces wood and lets assume that in order to do that I first have to pre drill some holes. The drill that I could use to do that, mediates between hand and wood. To know how to make a hole in a piece of wood means –at least partly– to know how to use a drill. The technique of making holes lies embedded in the technique of using a drill in the right way.
The usage of the tool embeds some proceedings that are generally used to serve a 'bigger' technique, I use the drill as a component embodying some proceedings in the procedure of making a table.

18.

Decreasing potential, increasing actuality.

Imagine all the shapes and constructions one could potentially build with hundred bricks. Straight walls, with a corner, in a circle, a few stones wide and really tall or short and long.▪ A wall, a pillar, a chimney, a block.
When you start laying the bricks, adding mortar and using that to glue some of them together, you can probably still build most of these shapes. But the more bricks you lay, the less shapes are possible to build. When starting a second layer, you might not be able to change the first anymore. Where four stones are laid straight next to each other they cannot be used in a corner anymore.▪
The more one uses technique and layers ome planned proceeding after another the more and more a final outcome starts to shape. With every brick one lays the possibilities of making anything else than what is being made, diminish.
Actions performed in a technique stack like the bricks do when they are used to build a wall.
The actuality of the material on which we employ techniques implies causality, because proceedings have irreversible consequences on it. A plate of wood cannot become a trunk anymore, a beam which is cut in two cannot become one anymore in the way it was before. Actions are lined up as such in order to form the desired construction. All actions performed to a piece of wood to make it into a table, will make it look more like a table (and thus make it less likely for it to have any other function than that).



19.

Equilibria

The table is finished when some kind of equilibrium• is reached. It *works* when all legs of the table are of the same length; the table is sturdy and stable.
States of equilibria are the states a process reaches where it does nothing unexpected. The goal of the technique of building a table is to achieve the point where thtable can stand on its own legs without collapsing into a pile of beams.
A steam engine is built to produce a stable flow of energy. An experiment becomes a technique when it works. The tool works when it proves to be reliable. Techniques usually help to transform one state of equilibrium to another, this can be part of a bigger process or exist by itself.
Techniques can be cut up and may consist of a multiple of equilibria reached. After using a saw to saw, we have a beam, that will remain a beam even when we put it aside. We could take a little break after sawing the beams.▪

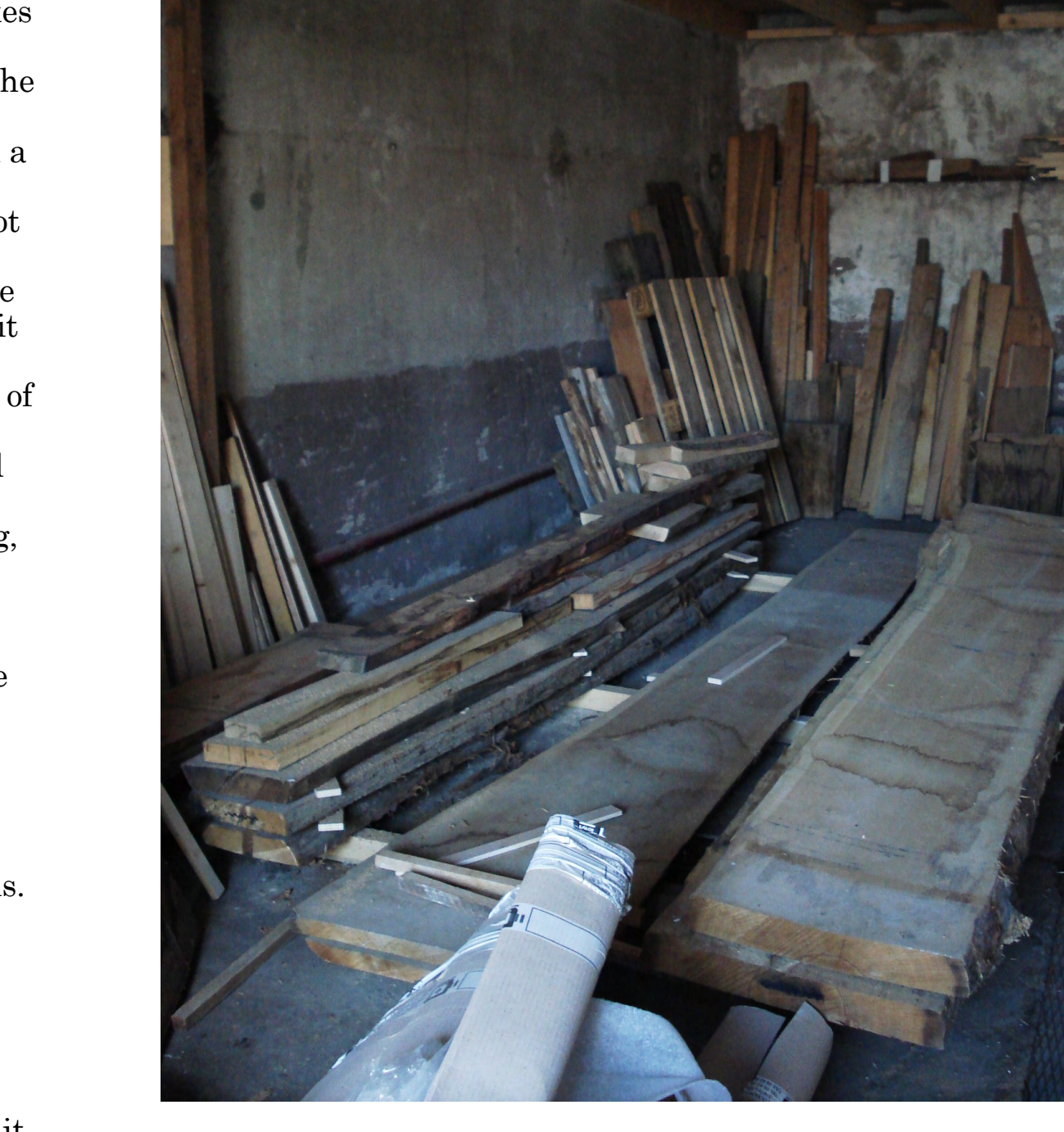
19.
• *"If one allows an intense flow of energy in and out of a system (that is, if one pushes it far from equilibrium), the number and type of possible historical outcomes greatly increases. Instead of a unique and simple form of stability, we now have multiple coexisting form of varying complexity (static, periodic and chaotic attractors)"*
Manuel de Landa, A Thousand Years of Nonlinear History, 1997

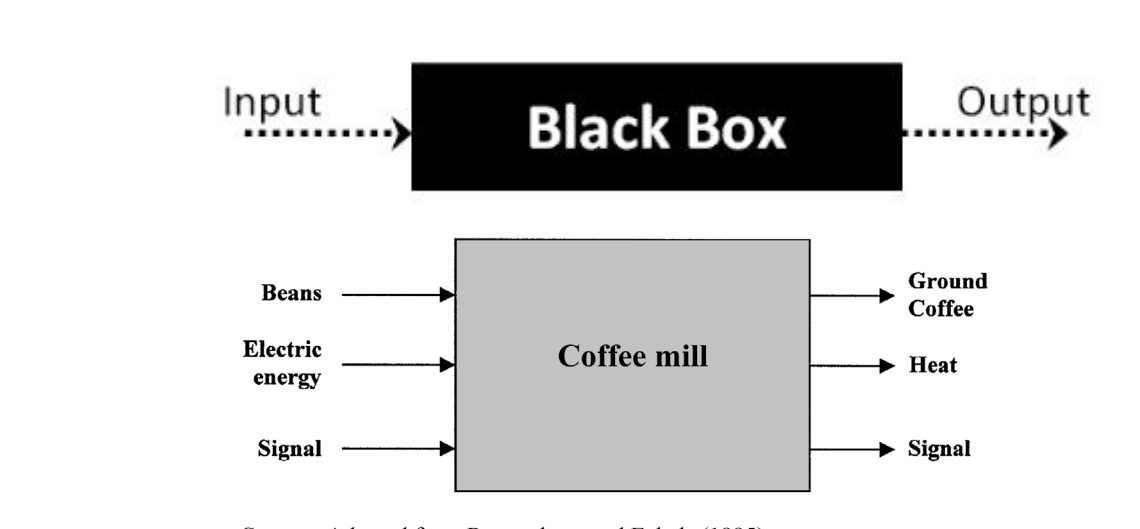
20.

Wrappings

Building a table on a desert island would work a lot different from the procedure sketched out before.
We would perhaps connect available branches by wrapping rope around parts that we want to secure, that we want to sturdily stay together.
The ancient technique of 'wrapping up' (mummies!) is highly productive in many cases. We wrap bread in a tea towel for it to stay fresh, we prevent wet clay from drying out, by wrapping it in plastic.
Somehow it works really good to control things by securely closing them up from the outer world. Chicken stay where we want them, when we put a fence around them. Marble's stop from rolling anywhere when we put them in a box. Animals become a more reliable source of meat, milk or wool when not only a small, select group of skilled hunters are able to catch them but everybody has access to them by just opening a fence.
The steam engine domesticated a flow of energy and made sequences of mechanical and electrical elements controllable with an easy push on a green button.
When multiple actors (parts, elements, proceedings) become one and are able to work in a bigger network as component, they are considered a blackbox.•▪
The green button that enables us to use a machine is mounted on a metal encasing that paradoxically makes it accessible by capturing its working. That whats makes the machine convenient or efficient blocks at the same time our view of how it actually works.
The common battery is another good example of such a blackboxed component. When we think of a battery, we think mostly about its input and its output and not so much about what is inside this little thing.
The battery stores chemicals that interact and release a flow of energy. It works at the moment of plugging it into an electrical device.
The technique of sawing is 'plugged in' in the process of building a table in a similar way as the battery in a milk foamer. When a carpenter cuts a piece of wood to make a table from it he is at that moment not consciously aware of the actual working of the sawing, but is focussed merely on its output.
While sawing has a whole science in itself, when we make a table we habitually perform a procedure that we know gives us a desired result. At the moment the I am questioning the how to of sawing (because it is the first time you are holding a saw, because the saw breaks or the sawing doesn't work for some other reason), you are no longer busy with the greater goal of building a table but probably experimenting and trying to improvise and invent problems and solutions. (Why doesn't this work?)

20.
•▪ Bruno Latour, Science in Action, Opening Pandoras Black Box, 1987





Source: Adapted from Roozenburg and Eekels (1995)

21.

Know-what and know-how

De Landa teaches us that the difference between *know-what* and *know-how* lies in the way we acquire it. Know-what is the type of knowledge we gain for example by reading books, by tracing sentences that express things we consider somehow true. It uses representations and deals with appointing meaning to things. Know-how is the how to read, apart from what it (the letters) signifies.
To bike, to read, to sail, to lay bricks, to saw, to jump, to drive are all *skills* we acquire by doing, by practicing with actual material and hands, not just by reading about them or passively watching them happen. (Reading about reading doesn't make you learn how to read?)

22.

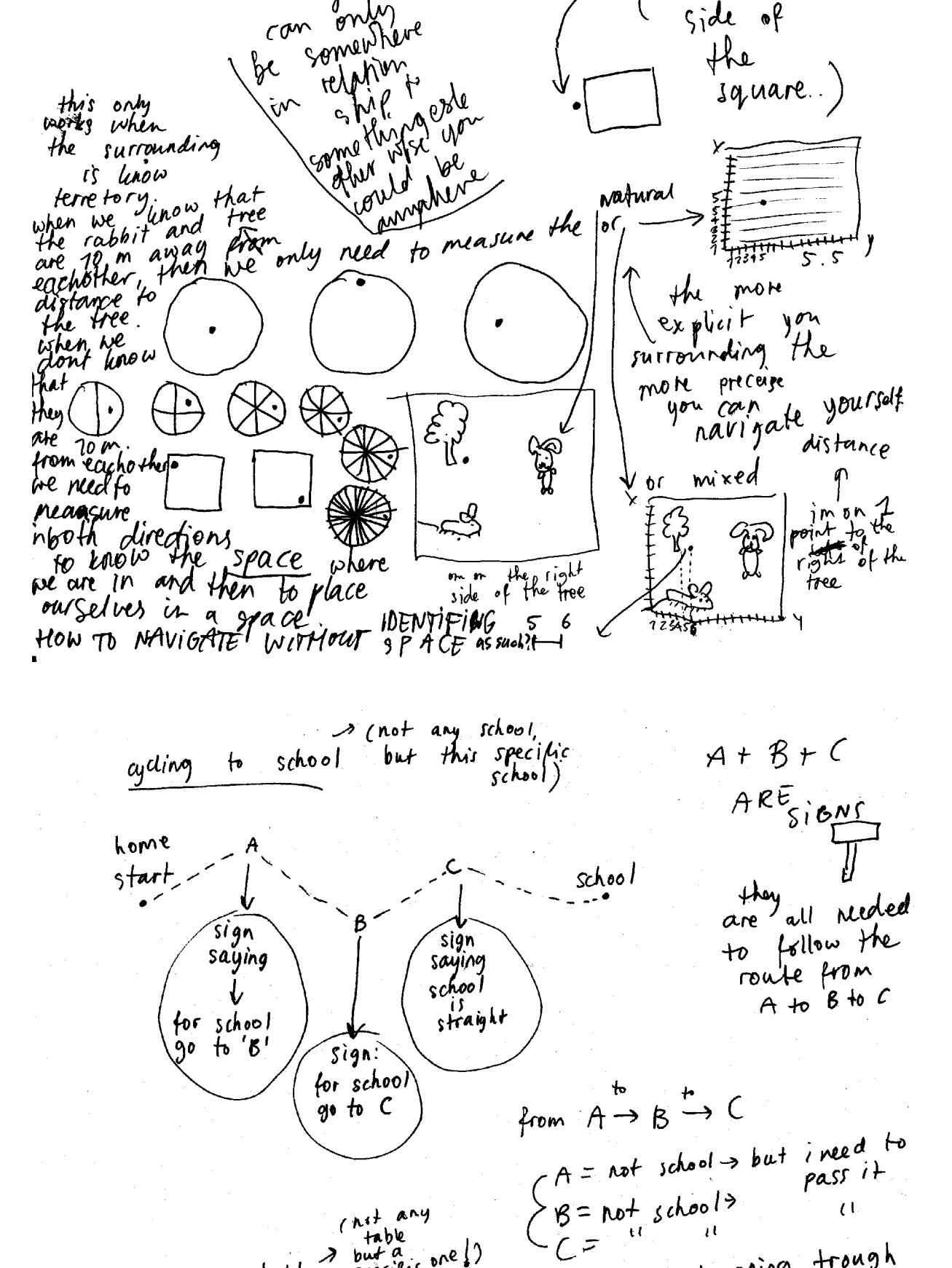
Anywhere or somewhere

Equipped with both know-how and know-what, we are able to make our way through the world, going here or there.
Know-what helps appointing location; when we know-what a bike is, we could answer the question "Where are you?" with "I'm on the bike." When we know what 'tree' and 'next to' means, we can say that we stand next to the tree. Know-how helps us to change location; when I know-how to cycle I can use this skill to make my bike bring me anywhere.
Sometimes though, I don't want to go just anywhere, but somewhere. Often, the actions I perform have a use, a function, a reason or make somehow sense. I will for example step on my bike, to go to school or to a bar to meet a friend. It happens rarely happens that I step on my bike to go anywhere.
While cycling (anywhere) is pure know-how, 'cycling to school' requires a bit of know-what too. If I would be blindfolded and dropped somewhere in a unknown city with the task of cycling to school, the first thing I would probably do after taking the blindfold off, is to navigate myself; Where am I?
I do this by tracing my surrounding. I see cars, houses, water; I'm in the centre. I see a road sign. I know that these kind of signs are reliable and thus I (skillfully) read what it says. From symbols painted or printed on wood, plastic or metal, I deduct a word that means 'school' and an arrow that means to point out the direction where that school is to be found.

23.

Navigation

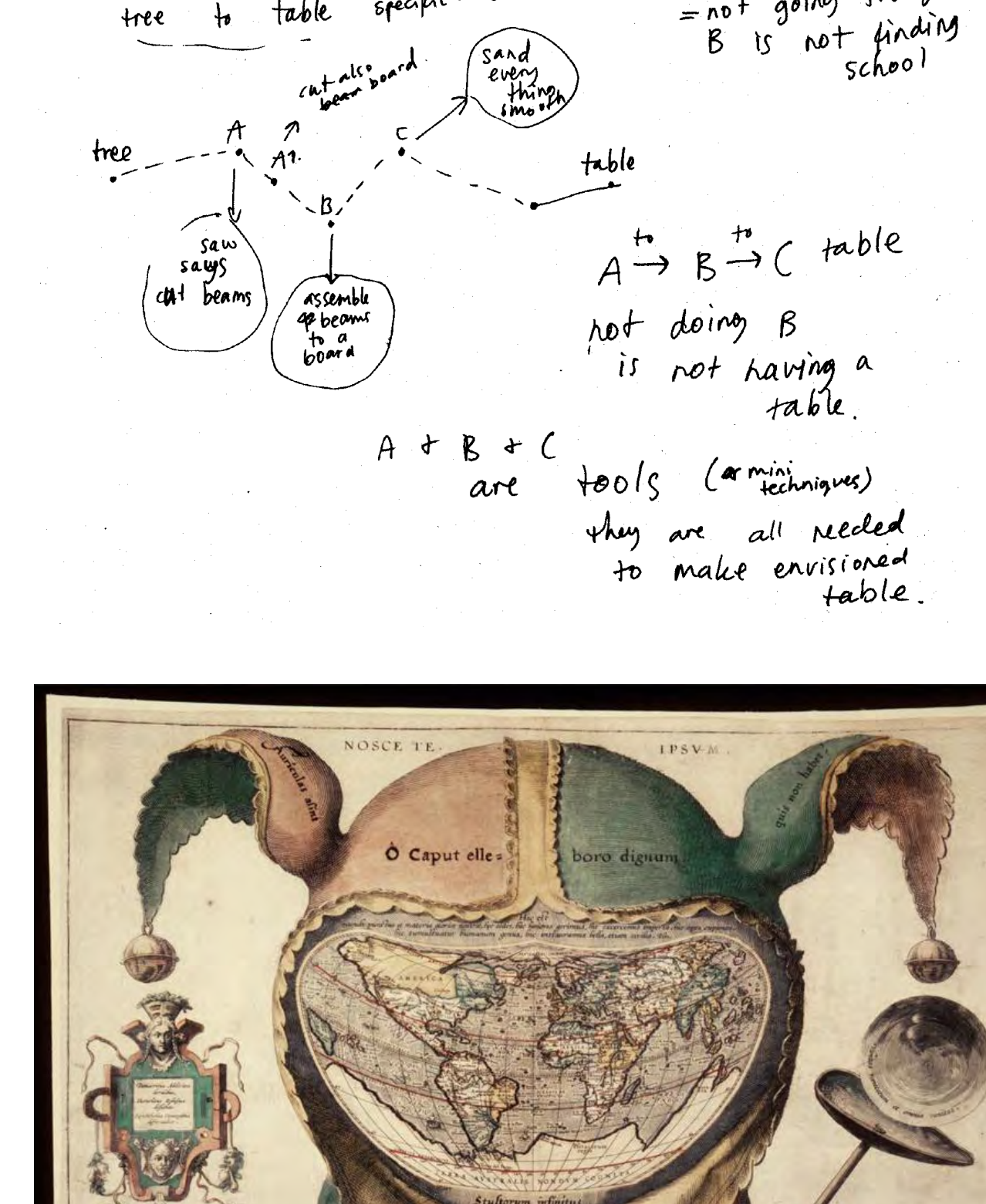
We listen before we talk, in order to say something sensible instead of saying nonsense, we read and deduct meaning from the road sign in order not to go anywhere random, but somewhere specific. Tracing images help to guide us what to say or where to go. We use *working images* around us to navigate ourselves. They work as models, moulds and representations that help us envision the possible steps we could take and where those would lead us.▪
We choose a path, a technique, set of rules or instructions to follow in order to achieve the goal we envisioned to reach.
The road sign is a point that we use to navigate ourselves and define a position from. The text we read, we can also use to navigate ourselves; we agree, we oppose, we like it, we don't like it. When we want to present our point of view we can do this by making a representation of our position. To signify that we oppose to something written in a certain text, we could for example write a critique. With this critique we place another image in the world, from which people can again navigate themselves through. The better we master skills, (reading, writing, talking, listening) the better we can define our position.



24.

Skills as tools

Tools and techniques are associated mostly with *skill* and *know-how*. Skill is needed to handle a tool and techniques can only be properly learned by practice. When we have the know-how to make a certain tool or technique work, we are able to insert them as working images. We do so at the moment that we want to use a tool or technique not just for the sake of using it, but in order to achieve *something*.
When building a table, the saw takes up a similar position as the road sign does on our search for school.▪
Although we need skill to use them (reading, knowing how to saw), this knowledge is likely to get implemented rather unconsciousl and habitual in the moment we are interested in the greater goal of reaching school and making a table. The know-how becomes overshadowed, by the use we appoint to it and merely becomes a compulsory point we have to pass from in order to reach our destination.



25.

Understanding through inscription

Instead of wandering through the city desperately looking for any sign that helps us going somewhere, or tells us where we are, it is much more efficient to magically unfold Google maps from our pocket and use it to propose us the shortest or fastest route from A to B.
The map works as a tool that mediates between our feet and earth, just like the saw does between hand and wood. We use it in order to get somewhere, to reach there where we wanted to go.
Because we understand that the measurements, points, lines, colours and symbols on the map signify real places, data and relationships, we use it to mediate how we relate to the world.•▪
We use the map as a productive model of reality that we consult to plan routes and paths of action. First we trace the lines of its image and then we make the actual steps in the world it represents.

25.
•▪ The Fool's Cap Map
"O caput elleboro dignum" translates as "O head, worthy of a dose of hellebore" (Hellebore is a plant used medicinally since Antiquity and was reputed to cure insanity and madness.) Presumably made between 1580 and 1590, unclear by whom.

26.

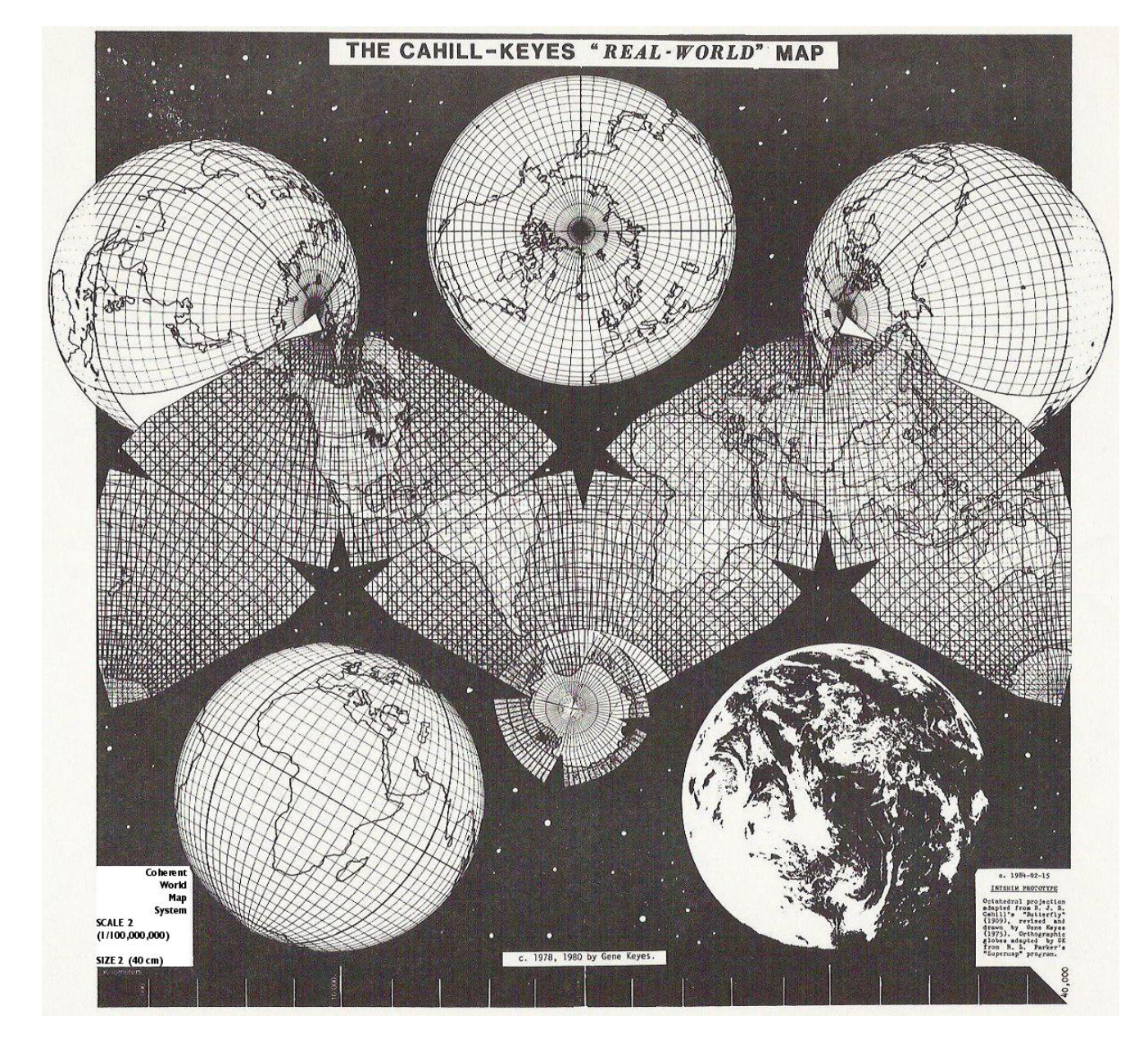
Examples and coordinates

It is a common praxis to inscribe the contents of one system into another one, in order to explain them.
We use representations, images, models or examples to help our brain envision and understand. I talk about plants, boats, trees, bricks and bikes because their images help to appoint meaning to the things I'm trying to say.
I trace the way a brick wall is build, to illustrate the working of something else. Information on maps (like topological points in all kinds of spaces) is explained by inscribing them into (Cartesian) coordinates. This is a way to help us to define every point, separately from the other points. A is located at (1,6) and B is signified by (3,4). The coordinates form a reliable, *working*, stable image in which points have a fixed meaning and location.
The map is a productive representation, it gives a useful overview of the world that we normally cannot perceive as such. But in order to make such a big world fit to a small piece of paper, some changes had to be made.
The contents of the real world are sieved through the Cartesian filter which results in the downscaling and flattening of the world. A whole bunch of information doesn't even fit through the maze of the filter. 'Less relevant' information (including a whole third dimension) is eliminated as a whole in order for Amsterdam to become (52,5) and Berlin (52,13)

27.

Truth and use

When we put on a pair of sunglasses we see the world coloured differently. To determine how they change our view, we can simply put the glasses on and off to compare the difference in how they change the perception of what we see.
We observe images that we recognize as world maps as looking through a pair of super-zoom-out glasses. We take for granted that something which says "REAL-WORLD MAP"•▮ works as a zoom out view of the ground we stand on.
But the difference in what we see through the super-zoom- out lens of the map and what we observe by looking at the world with our bare eyes, is too big to determine the actual working of these glasses. The map we observe might as well show microscopic matter or represent the behaviour of sharks in their natural habitat, that we only interpret as the image of the world, because we cannot rely on our own experience and are left with trusting "REAL-WORLD MAP" when we are in need to see the world as a total and don't have airplanes, helicopters, satellites or spaceships at hand.



27.
•▮Gene Keyes refined version of the 'Butterfly world map' invented in 1909 by Bernhard J.S Cahill as a foldable rubber-ball globe.

28.

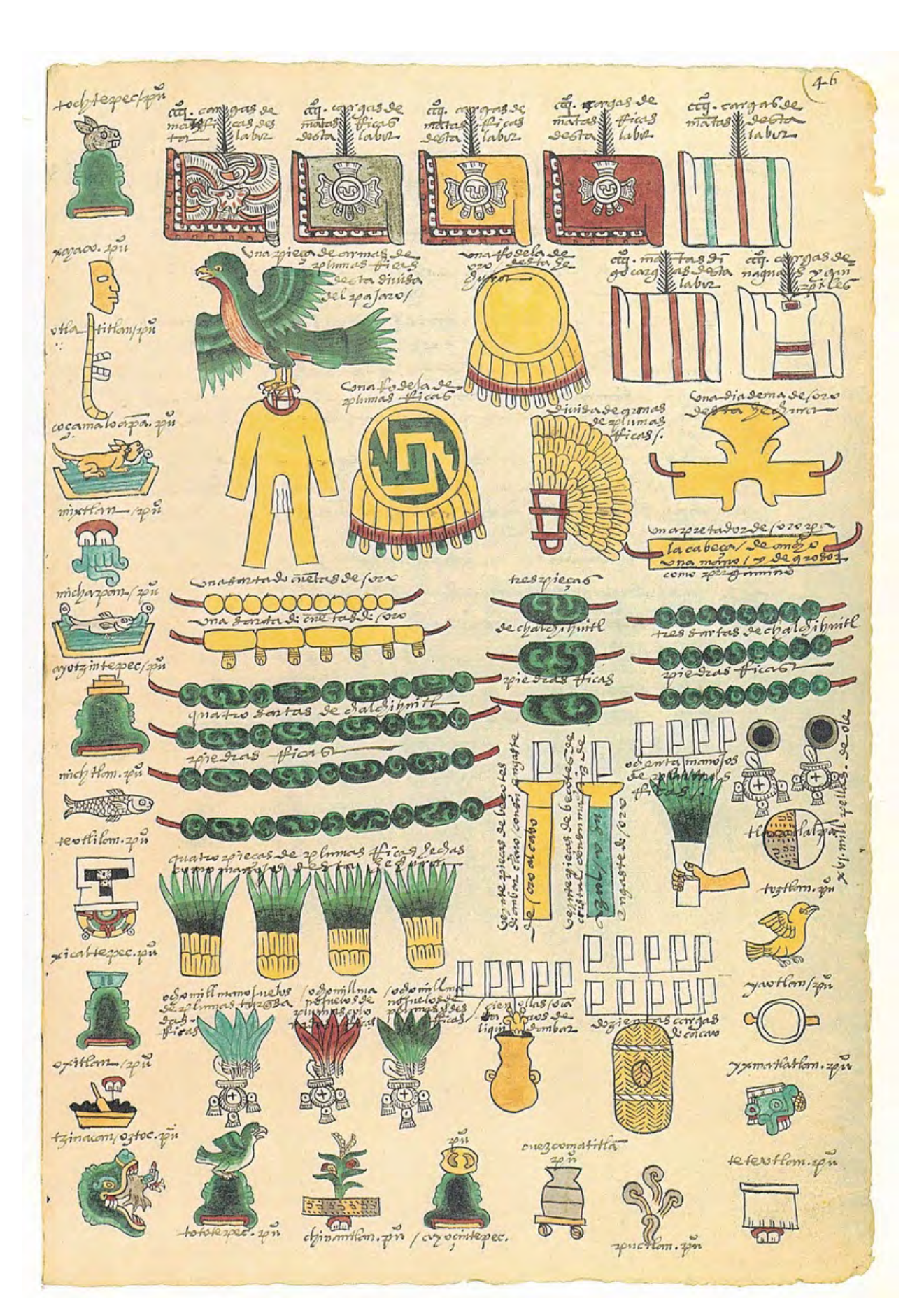
Framework and territory

The heyday of cartographic history, the 16th century, is often referred to as 'age of exploration' or 'age of discovery', but also has suspiciously much to do with notions like *conquistadores*, colonization and imperialism.
Maps were made not only to navigate explorers and help them guide their expeditions but also to represent what they laid hold on these expeditions.
Back home, the drawings that mapped their discoveries where the only super-zoom-out-glasses being available to see this newly discovered world and taken for truth, in order to make productive colonies from otherwise useless pieces of jungle.

29.

Representation or model

The maps the 16th century explorers took home did not just represent neutral land but captured it in measurements, amounts and delineations.•▮ Rulers and pencils were used to demarcate land for it to become territory, states, nations, ours and theirs, in and out..
The image of these maps, tried to represent the 'real' as accurate as possible and helped to forge another (more manageable sized) layer on top of reality that resembles the metal layer around the machine, that with the green button enables us to, with the simple press of a button, make a whole hidden world come into motion.
It became possible for decisions to be made, not only on the actual place of the matter, but from an external point of view. Looking at measurements and numbers and armed with a pencil, powerful men could impose their decisions without even being at the place were they were to be implemented.
Maps are not only representations that were made by tracing the properties of the actual world, but serve as a model in itself, which can be used to plan changes to what it represents as well. The map maker first needs to follow the coast line before he can draw it on the map and the map reader first traces this drawn line, before making an actual trip along that same coastline.
To build a good table, one does not necessary needs to be a skilled carpenter because reading a manual and following its instructions builds tables as good and sturdy. It is much easier to build a table from an Ikea package than from a tree. On average, people are more skilled readers than carpenters and draw boundaries with pencils more confident than with guns or swords.



29.
•▮*Codex Mendoza* (Named after the then king of 'New Spain'); Made about 20 years after Spanish conquest of Mexico with the intention of bringing it back to Europe. Describes, indexes and comments on the history, habits, pictograms and daily of life Aztecs.

30.

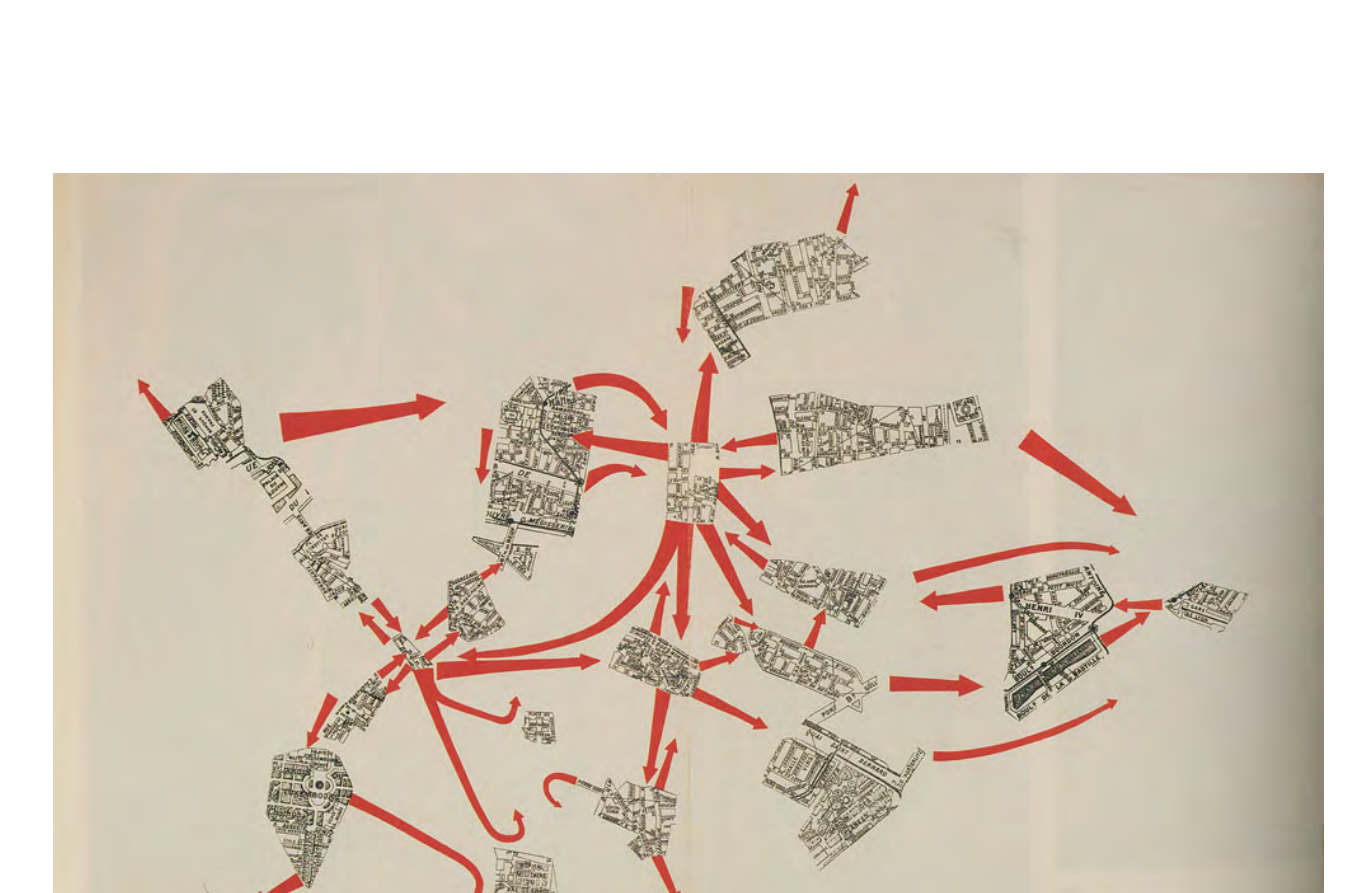
Same goal, different skill

When we recognize an image as being text, our way of looking transforms in some kind of *trace-gaze* that habitually locates itself in the upper left corner of the image and obediently tries to understand what the text signifies. The subordinate know-how of reading serves the know-what without us even noticing. (When I have a hard time reading something, often it is not because I cannot see the letters, but instead I cannot see what they are supposed to mean, to signify.)
To make an unfamiliar machine *work* we consult the manual (or a specialist) that explains which button to push. Instead of engaging with the actual machine (there where the action takes place), it's common that we only trace its *surface* to look for the 'reset' button the manual was talking about.
The manual becomes a superior centralized point which we need to consult first. In order to make the machine work, we need almost no technical know-how of how the machine works, but merely need to be able to deduct meaning from the manual that *represents* the working of the machine.

31.

Mapping!

Now I have to remind you of the distinction I proposed in the beginning of this paper. (It took a while...)
It may be clear by now that the world map is a tracing and not made by *mapping*.▮ A representation of the world that is made by tracing trademarks of the world, made to be used again to trace paths of action from. Mapping offers another approach to action.• Its actions are not planned on forehand by any authority whatsoever but are decided on the spot, by our own bodies and with whatever means available.
A *path of action* forms by itself.



31.
• "What distinguishes the map from the tracing is that it is entirely oriented toward an experimentation in contact with the real. The map does not reproduce an unconscious closed in upon itself; it constructs the unconscious"
Gilles Deleuze and Felix Guattari, A Thousand Plateaus, 1987
▮Guy Debord, Psychogeographic guide of Paris, 1957

32.

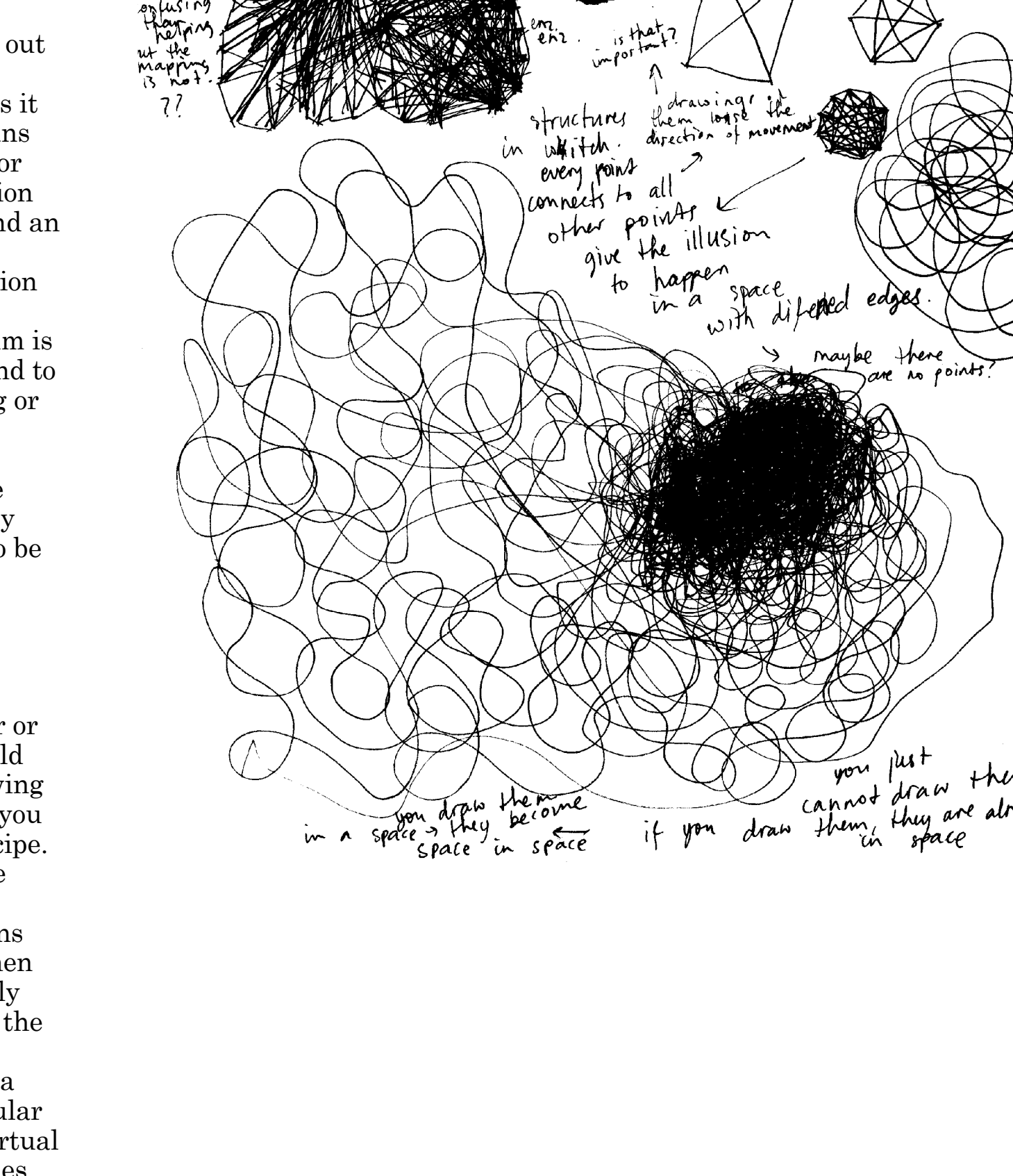
Constructing (in) a playground

Writing on the computer works super fluidly. I don't have to form sentences in my head that I afterwards trace with my fingers. Instead of decisions being made in a centralized point (the brain, the manual, the map, the rules of a technique, the body of a utensil) the brain and fingers constantly react on each other as being in a dialogue. Eyes and the fingers that assemble the text to- gether, they are of the same importance. Together they constitute a symbiotic network that makes action take place.
Different to writing with pen and paper or typewriter, writing in the computer affords actions of typing to be temporary. No pencil marks after erasing, no type-ex needed. The time lost in rewriting, adding some letters in between or making them change place is too little to be relevant.
The letters with which I construct sentences are no longer bricks that I stack to build a wall, but more like lego stones that I use to play, to make potentially temporary, sketchy constructions. Mapping does not merely work to reach predefined points, its actions do not consequentially stack and end up in a state of equilibrium, but its procedure establishes itself through experimentation and improvisation.
The computer screen offers me a space of action other than the *actual* world, without pretending or trying to represent that world. (As the world map does.)
The actions I make in this space don't have to make sense, to function, be efficient, good, to work or end up in being a *working image*. Just because they don't have to become anything preplanned, letters are able to organize themselves into words and sentences that work to construct their own little world in which they come to exist rather than trying to form words that fit in an already existing world.

33.

Exploration

In the greenhouse I felt like being on an exploration, eager to see what was behind each plant rather than only trying to get it over with. Mappings are turbulent explorations, without the part of reporting them, by (for example) making maps. It is setting foot on unknown land and wandering around without a plan, handhold and oversight but with a desire to find the new and unseen.
The only thing sure about exploring is, is that it will find something and most likely it will find a multitude of things rather than one. It does not look for an endpoint, but works to unfold potential.•
Mappings move *anywhere* rather than *somewhere* and find *anythings* rather than a *something*.
Instead of locating obstacles and roadblocks and anticipating on how to overcome them or get them out of the way, mapping moves along by changing proximity and distance and by bumping into things it meets on the way, improvising with whatever means available or being lead by what attracts attention or curiosity. Without the presence of a superior decision making centre (the brain, the manual, the boss) and an endpoint that needs to be reached (a product, a finished object, a working machine, a thesis), action tends to organize itself differently.
Instead of stacking proceedings until an equilibrium is reached or a working image appears, mappings tend to wander and detour. Instead of appointing meaning or names to things, defining a point in the world, inscribing things into domains, territory or coordinates, enclosing potential by boundaries, the focus lies on the things in themselves, on what they express and afford me to do, on how they appear to be in that instant and by what they are surrounded.▮



33.
•James Corner, Agency of Mapping, 1999

34.

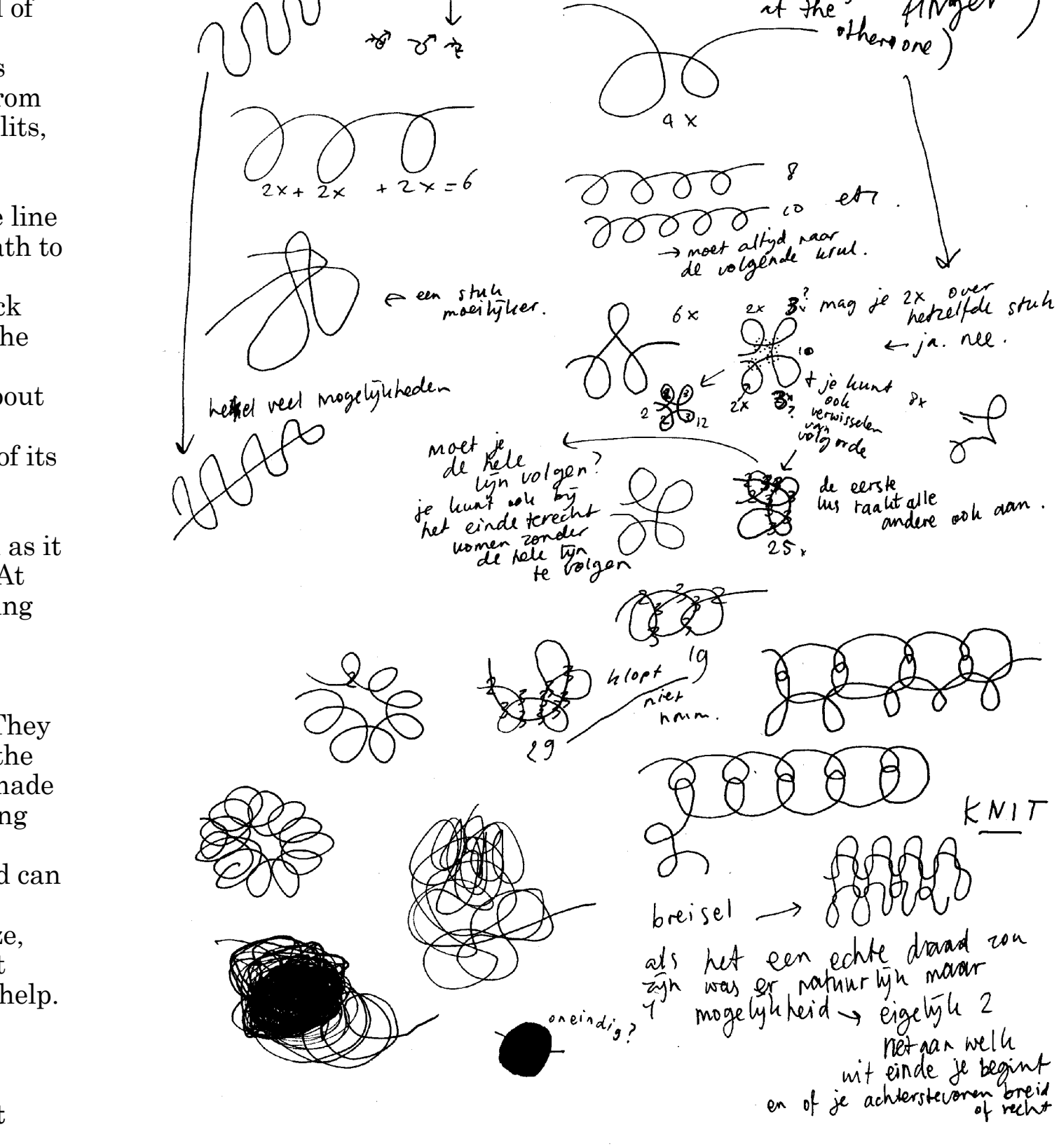
The one or the multiple

Tracing is a movement from for example the finger or the eye, that skillfully knows in which way it should move. It is putting your finger on a map and following a line that represents the highway that will bring you from A to B. It is following the instructions of a recipe. It is also the zigzagging movement your eyes make while reading this.
Tracing is per definition a linear action. That means that there is only one way to *properly* follow it. When you would read this text backwards, it will probably not make much sense. (At least it would not make the kind of sense I intended it to make.)
At the moment a can opener is being used to open a can, that is its only actual state. Next to that singular actual state there are a multiple of possible and virtual capacities the can opener also has. The possible ones are the ones you can imagine. (What would a gorilla do with a can opener?) The virtual ones are the ones undefined and imagined.
Because mappings look in the multiple virtual, the undefined and the not-yet-existing, its *paths of action*, do not work linear and towards a goal, but to fork and diverge to explore a multitude of possibilities.

35.

Tangled image

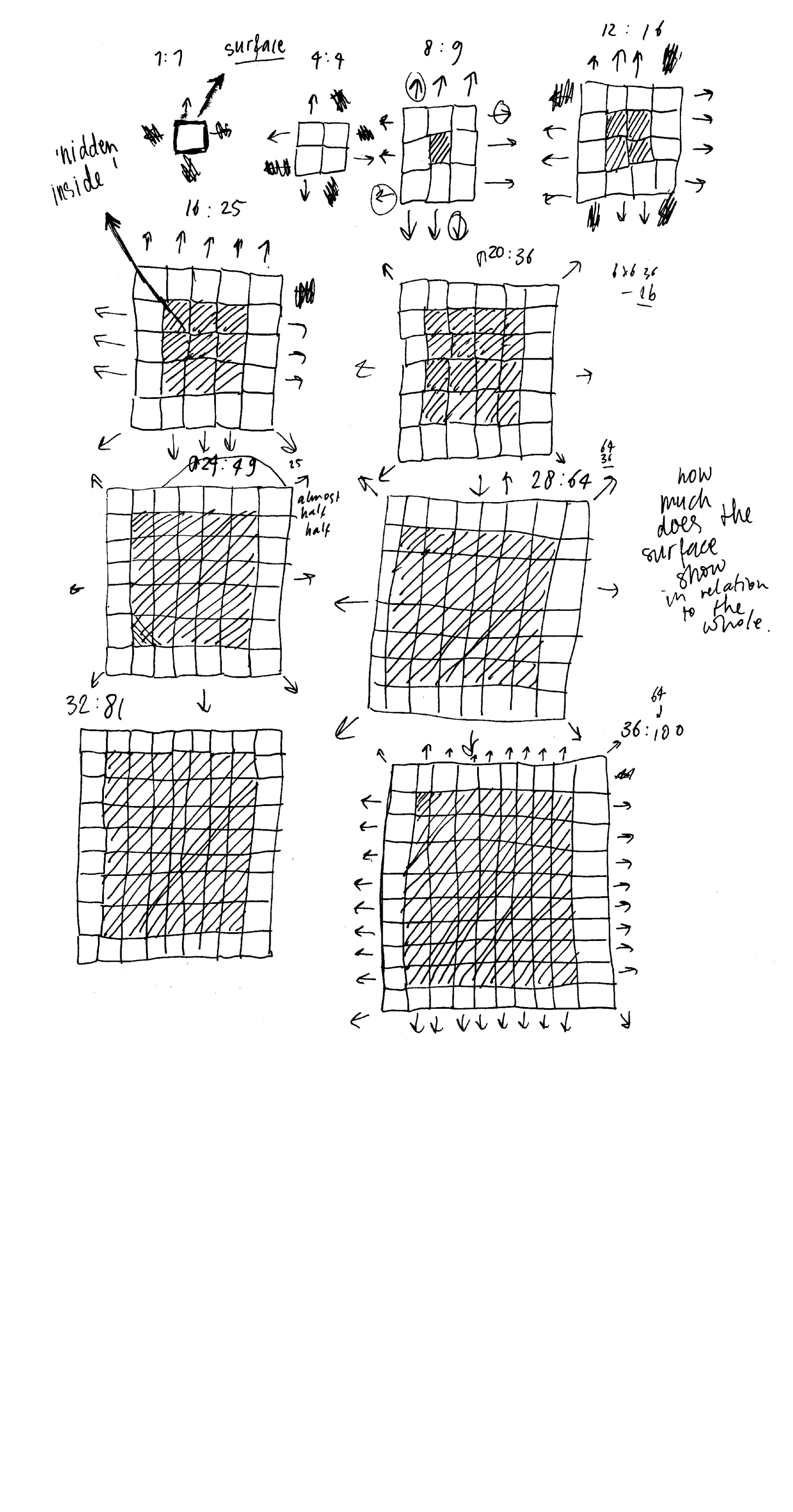
Different from tracings and their 'straight to the point' paths of action, the images that mappings offer are ones constructed of tangled lines and chaotic patterns. A tracer will most likely find himself lose track, get stuck and lost in no time trying to follow this ravel of loops and knots.▮
The more times its path of action loops and crosses itself, the more possibilities there are to follow it from beginning to end. Every time the line crosses or splits, it affords us to take a left or a right, so to say.
The ultimate path of action a mapping could offer, would be a line that crosses itself so much that the line itself becomes surface on which there is not any path to trace anymore but only new lines to be drawn.▮ (Imagine a drawing that makes a whole paper black and inky and drawing on it with a white pencil.) The importance of mapping lies not in the image it produces but in its process of becoming. It cares about how it makes and not about what it makes.
An contingent end result is merely a consequence of its procedure rather than a goal in itself.
In fact, you could even say that the mapping only exists in action and seizes to be a mapping as soon as it gets hung on a wall, finished or bonded in a book. At the point of putting it aside, the mapping stops being an exploration and shifts to be a representation of what it found.
The leftovers of the labyrinth path of action, the mapping leaves behind, could look like anything. They could look like traces of approaches to working in the garden or fixing a broken lamp. They can also be made by using a keyboard or a pen and can end up looking like diagrams or text. Mappings don't work to *represent*, they don't produce images that work and can be traced simply because they were not made by tracing either. When exposed to habitual trace-gaze, (because its image looks like text for example) that tries to deduct meaning out of it, it will offer little help.



36.

Making a point out of not making a point

I began making this essay without really knowing what it was going to become. More than planning out on forehand what I wanted to say or where it was going to be about,
I just wanted to start exploring writing, to see how it works and what it affords me to construct. But of course the purpose of this paper is that
I finish it, that it becomes a readable text that makes some point. (In fact this is not just an essay but my thesis, which somehow works to represent my point of view or mark my position at the moment of leaving the Rietveld playground to set foot in the 'real world'.)
Even when the point I want to make is a paradoxical one, namely "I don't want to make a point.", I can only do this by making one.



37.

Actually writing

I really like building machines, but usually they are not the ones of the proper type. When somebody else wants to use a typical 'tool' I make, I usually stand next to the person and say things like "Press a bit more on the right, its a bit crooked" or "Watch out the handle is not properly attached so hold it on the metal part." While writing I realized that I needed to approach this writing more like building a proper functioning machine (one of those with a sturdy metal encasing and starts when you press the green button).
To communicate what I had found, I had to stop finding and transform a dynamic process which was an ongoing interaction between my body and the things around me, into a static stable state of *finishedness*. The task of making this thesis was not so much to invent and construct thinking, but more to actually write it down. To trace what was constructed in the virtual playground of the empty text files and pieces of paper with endless potential outcomes and to untangle turbulent lines of thinking or mapping in order to actualize the definite version that more or less properly explains and represents what I found on the way of writing this thesis.

38.

Divisions

When you stop stirring hot milk, a skin forms on top of it. The surfaces that appear around things, mark the transitions of dynamic processes turning into static images. These surfaces make the process they capture work but at the same time block our view.•
Working images installed in the world constitute divisions between lots of things; the real and the representation, the consumer and producer, spectators•• and actors, the writer and reader, the what and the how, the working and the interface.
All these separations divide a growing amount of domains and territories that are all characterized by their own sets of specific rules, norms, values, vocabularies and frameworks.
When I write a text, I'm a writer and when I read a text I'm a reader. The one type of making belongs to domain X and another type to domain Y.
But why being merely a reader when observing text? Why accepting and following the boundaries installed by the surface of things? Why would I restrict myself only to make something *within* a domain?
What happens when we do not only efficiently use our trace-gaze to deduct meaning out of a representation? How to change hands that blindly trace the surfaces of machines, searching for orders to obey and hoping for a green button to push, into hands that are holding screwdrivers and are ready to explore, invent and break through the skins formed on things in order to construct their own little worlds and make their own rules?

38.
• *"Bilder verstellen was die vorstellen. Sie stellen sich vor das, was sie vorstellen sollen."*
Vilém Flusser, Television Image and Political Space in the Light of the Romanian Revolution, lecture, 1990
•• Guy Debord, Society of the spectacle, 1967

39.

Actually...

There is no such thing as a division between mapping or tracing. When I *actually* make I inevitably deal with a mixture of both. When I *actually* make anything I will inevitably end up with having made something. Even without considering if the making has a goal or not, actual material always implies causality, stacking, linearity and some type of planning.
The world is not only inhabited by (seemingly) reliable and stable structures but also by uncontrollable forces. Rain is able to all of a sudden obstruct the making of a chalk painting on the sidewalk and improvising will be needed (plastic! garbage bags! sticks! hairspray? wax? oil? oil paint! sand? cardboard! wood! umbrella!) in order to save efforts from being destroyed by erratic behaviour of systems we can only try to deal with in the best way we can.
Drawing this division, though, gives me the opportunity to describe the differences between tracing and mapping. To illustrate the dominance of the first, the domestication of the making process and the monopoly of the working image and the hierarchical structures making and using them brings with it.
To attempt to understand a world in which we ignorantly take so many things we use for granted, consider a green button as a main component of a machine and are left with trusting the labels, names and titles that try to convince you that they truly are what they hide.

40.

...and virtually

Mapping is a tool, more generic than a flat screwdriver. Its method shapes itself in dialogue with what it meets and takes form when it is in action and thus mapping-screwdrivers fit all possible, potential and virtual types of screw heads.
We need tools and techniques of all sorts and shapes to open all types of metal encasings and try to overcome (open up, destroy, rip off, dismantle) the divisions installed by the surfaces that encase most of the things around us. Mapping helps to see beyond the traceable and superficial meaning, the what -of things.
It destabilizes the homogeneous slurry of things that are made through obediently reproducing certain norms and values without these necessary being shared or questioned by the maker, but collectively enforced upon them by the domain he finds himself in and accepted because of the need to fit in somewhere and because finding alternatives means jumping into the dangerous undefined in order to look for the new and the not-yet-existing.

41.

Toolbox

To bridge the gap between the singular actual and the multiple virtual and to make a (given) something a little bit more *anything*, we also definitely need traceable approaches. Techniques do not only help transforming something into something else but can also make a something do a multitude of different things.
Bruno Latour talks about the invention of the wall and the hybrid of the wall hole –"Often called a door"– that elevates the wall from plainly functioning to ultimately separate things as being in front of it and behind it. Technical knowledge and skill could not only help us to build doors but also to find out how doors work, how they don't work and how they could potentially work. When we acquire and use skill, tool, device and technique with awareness and interest in understanding their working, consequences and implications,we can use this knowledge to fill a portable toolbox that enables us to make anything.
To make us not only being able to choose from given options but to autonomously develop our own problems, solutions and positions, to be able to not be just straight to the point, but to detour and and get lost, to explore without being 'protected' by the walls of some domain that we find ourselves in, but to start making things regardless of *what* and *where* but interested in the *how* and *why*.

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