

II TOWARD A FANTASTIC GENEALOGY OF THE ARTICULABLE LUDGER HOVESTADT

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LUDGER HOVESTADT is Professor for Computer Aided Architectural Design (CAAD) at the Swiss Federal Institute of Technology (ETH) in Zurich. His approach, broadly speaking, is to look for a new relationship between architecture and information technology. He aims at developing a global perspective that relates to and integrates with developments in different fields such as politics and demographics, as well as technology, in a postindustrial era. He is the inventor of the digitalSTROM[®] chip and founder of several related companies in the fields of smart building technology and digital design and fabrication. A showcase of his recent work can be found in *Beyond the Grid – Architecture and Information Technology: Applications of a Digital Architectonic* (Birkhäuser, 2009). www.caad.arch.ethz.ch

“Actors, taught not to let any embarrassment show on their faces, put on a mask. I will do the same. So likewise, I am now about to mount the stage of the theatre of the world, where I have so far been a spectator, and come forward masked.”¹

“When contemplating the Notre-Dame cathedral, one had better consider how it compares with other cathedrals and sacral buildings rather than begin by visualizing it as an accretion of mineral solids.”²

In the last volume of this series I introduced a “fantastic genealogy of the printable”: today we are

- ¹ One of the earliest examples of Descartes’s writings from a lost notebook, preserved in a copy made by Leibniz, 1619.
- ² D. Corfield, *Towards a Philosophy of Real Mathematics* (Cambridge: Cambridge University Press, 2003).

printing not just written or drawn material, today we print all things that are, in a machinic and analytic way, depictable. And of course, every new abstraction of the techniques of writing—and we understand printing as just such an abstraction—engenders a new kind of language. Therefore we shall here, in a next step, attempt to abstract from both Saussure's and Chomsky's linguistic paradigms, and raise the question about the articulable on a new plateau. That's no easy job. Of course not. And I am far from pretending I have fully understood it or am able to embrace it in toto. I am an architect and a computer scientist who chafes against the limits of his disciplines. Nevertheless, a promising body of thinking is shaping up.

Yet, even in a sketchy, preliminary form it would exceed the scope of this book; hence we shall present it in two parts. The first one, here below, “Toward a Fantastic Genealogy of the Articulable,” prepares the ground for the second one, “A Scheme for a Fantastic Genealogy of the Articulable,” which will appear in the next volume of this series.

Thus, let’s begin in the fashion of the *Fantastic Genealogy of the Printable*, and examine today’s speech, examine what we are able to express, articulate with the new script. All this, as must forcefully be stressed, is in no way merely a decadent nicety, for this new manner of speaking turns out to be incomparably more powerful than anything we know. Indeed,

it is about the constitution of our digital, global world. But let us relax, lest we find ourselves incapable of clear thinking.

I 7,000,000,000



➤ [FIG. 1] P. 59



➤ [FIG. 2] P. 59



➤ [FIG. 3] P. 59



➤ [FIG. 4] P. 60



➤ [FIG. 5] P. 60



➤ [FIG. 6] P. 60

People. So many. Talking, speaking, discussing, arguing, shouting, quarreling, threatening, bragging, swaggering, strutting it, boasting, priding themselves, competing, fighting, exercising, educating, cultivating, fostering, managing, acting, refining. Since forever.

Getting up, washing, yawning. Writing, calculating, counting, integrating, planning, construing, fantasizing, dreaming, yearning, discovering, inventing, constructing, reckoning, simulating, optimizing, narrating, negotiating, arguing ... telephoning, listening in, watching in, doing checks, e-mailing, listening to music, ingesting news, googling for whatever: neighbors, the news, the latest flick, the weather, Earth, water, food. Security. Breathing. Spoken. Written. Thrust. It's noisy out there. Warm, cold, dry, wet. To run, swim, fly. Fields, buildings, cities. Workshops, factories, industries. Machines, appliances, applications. Landscapes, environment, nature, climate, milieu. Organs, organisms. To analyze, draft, calculate, construct, visualize, encode ... five hundred years of analysis. Plenty moved. Plenty changed. Much curiosity, plenty of urge. Heaps of ambition, toil, aspiration, impatience. Mountains of doubt, fear, shudders, panic. Lots of mistakes, of dying, of sorrow. Analysis before synthesis. So as to forestall the inventing of novel truths.³ Sheltered in the whole. Immobile mover. Yet invariably the annoyance of those gaps between pieces that won't add up to a whole; of some Pythagorean quantities that comprise proportions while being neither even nor odd; of Leibnizian numbers that are functional while lacking proportions; of some Gödelian operations that are not functional yet articulable.

So what is there to do? Today? Slim trust broadly in language,⁴ in things spoken, talked over, promised, agreed; distrust rather toward attribution, abstraction, notions stemming from those parts that

3 Jules Vuillemin about Descartes, in *Introduction à la philosophie de l'algèbre*, vol. I, *Recherches sur quelques concepts et méthodes de l'Algèbre Moderne* (Paris: Presses Universitaires de France, 1962).

4 Alain Badiou, e.g., discards the idea of "notion" and argues explicitly for handing language over to axiomatic algebra.

won't go into one integer. It is within that distrust that language is being analyzed and acquiring its significance today as a structure, as a construct shorn of the unexpected. And not without success, either: Linguistic Turn, Structuralism, Post-Structuralism. And it's inheriting the sanctuary within the whole as well as the repugnance against any parts that won't fit.

Hence apprehension mostly outstripping any marveling at the richness of our world. This sheltered view unable to perceive such richness other than reductively in narrow terms of affluence. And in fear—of shrinkage, of using up resources. And in shame—of consumption. Zero energy, e.g. as though no-energy might throw up anything but dead-lock. Balance. Entropy. Uniformity, lethargy. Nothingness. Boredom. Individuality, creativity, caring, provision, security, equality, justice, brotherliness⁵ ... pawns in the entropic language game of analytic-functional balances.⁶

Please bear with this text's impatience. Harsh argumentation about many of today's thought figures and their champions—do not take it as verdicts but as appraisive pointers letting a thought be articulated quickly and without too many words. Critique is not destructive as usual; it is, unusually perhaps, valuing. In the process we will, on the one hand, acknowledge the going notion that there is not enough space on our planet for everybody,⁷ while remaining aware of the dead end we'd be heading into, were we to follow paradigms of fundamental scarcity. On the other hand however, taking one step back, we will take



➤ [FIG. 7] P. 61



➤ [FIG. 8] P. 61



➤ [FIG. 9] P. 61

- 5 Jeremy P. Rifkin's popular *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis* (New York: Tarcher, 2010), e.g. contains the droll attempt at naturalizing, via the global technological infrastructures, all global problems into our capacity for compassion. How were this supposed to work, save through delegating guilt to technology at the price of collective submission to this very same technology? ... with the effect that, as a serf, one has absolved oneself of any guilt and involvement: just as witnessed everywhere in the Western world.
- 6 "Language game": term created by Ludwig Wittgenstein, *Philosophical Investigations*, 1936–46 (Oxford: Blackwell, 1953), § 23.
- 7 Interesting examples are the "green" Wuppertal Institute or the Rocky Mountain Institute, both characterized by notions such as "ecological footprint," and forty years proportionating of our cultural ways of life—endeavors as futile as they are prominent. These argumentations had their heyday in connection with the CO₂ discussion and the climate conferences in which, bowing to the diktat of general comprehensibility, calculating happens by the rule of three, and argumentation through proportionating ratiocination. Those discussions thus belong entirely and unequivocally to the thought universe of the fifteenth and sixteenth centuries, i.e. way before the advent of any technology. As though technology were not culturally invented and brought about, but a natural given. And here again, as an outgrowth of naturalization, the brazen demand of submission to some proportionality-reduced technology geared at an ideologically projected world population of four, respectively ten billion, but with an actual capacity of—as their complaint goes—less than one billion people, i.e. the equivalent of the fifteenth- and sixteenth-century global population. Cf. Ernst von Weizsäcker et al., *Factor Four: Doubling Wealth, Halving Resource Use; The New Report to the Club of Rome* (London: Earthscan, 1997); *Factor Five: Transforming the Global Economy* (London/Sterling, VA: Earthscan/The Natural Edge Project, 2009); or even with regard to factor 10, cf. <http://www.factor10-institute.org>.

the by now so familiar modern-times analytics as a specific idiom—without critically discarding it, for we owe it our present existence, our wealth, our capabilities in science, medicine, technology. What we are submitting, however, is that this idiom is found wanting in the face of us 7,000,000,000 people on Earth, and falling short of our capabilities, to boot. It will therefore not be enough to improve our effort, our coming to terms among ourselves, our disciplining ourselves. A more fundamental question arises: What if it were not our look upon Earth as a territory, not our tracing the moving shadows of the sun, not our capability for geometry that are our distinctive qualities? What if we were no longer dependent upon our geometrical intuition, but able to follow our breath, our speech, our articulations? If we became able to trust the fleeting, the breathed, the atmospheric? In antiquity and in the Middle Ages it was the substances spoken out as nouns that conferred stability and that most writing was committed to. In modern times their place is taken by the adjectives attributed to the nouns and traced and visualized through our analytics and our constructions. Now, in the face of global logistic infrastructures and generic availabilities, the fleetness of the spoken verbs seems to us the congenial medium for our inquisitive roamings.⁸



↗ [FIG. 10] P. 62



↗ [FIG. 11] P. 62



↗ [FIG. 12] P. 62

More congenial than the familiar intuitions that trace, shadowlike, the lines of the attributed adjectives—lines that in the global networks are becoming so arbitrary. Isn't the question rather, 0 or 1? Right or left? Time and again. How then can there be talk of intuitiveness, of lines, of transformations, of constructions? What is there to be traced? Which model to be learned from? Discovering what? Where to look for some orientation, some security? Seeing there isn't a path to be followed. Just 0 or 1. No longer any following the stabilities of the subjects or the moves of the predicates for us. We are now up to learning to dance, to juggle with the 0s and the 1s. Exercise, exercise, exercise, for achieving stabilities from our abilities.⁹

Let us therefore try to talk differently: let's cast the verbs first, let's provoke, assess, and bundle them with the old friends, the attributes, so as to assign them, as we have always done, to the subjects. How then may we cast our words, turn them, and set them, within the streams of our world,

8 We take exception to cybernetic utterances such as that provided by Buckminster Fuller: "I live on Earth at present, and I don't know what I am. I know that I am not a category. I am not a thing—a noun. I seem to be a verb, an evolutionary process—an integral function of the universe." *I Seem to Be a Verb: Environment and Man's Future* (New York: Bantam, 1970). Or to Lucien Tesnière's (1893–1954) "dependency grammar" with his core thought that "the verb rules the clause," *Esquisse d'une syntaxe structurale* (Paris: Klincksieck, 1953). They treat clauses as a function of their relationality, respectively their structure, thus putting—notwithstanding phraseology to the contrary—adverbs into the first place.

9 Cf. Peter Sloterdijk, *Du mußt dein Leben ändern* (Frankfurt/Main: Suhrkamp, 2009.) In English: Peter Sloterdijk, *You Must Change Your Life: On Anthropotechnics*, trans. Wieland Hoban (Cambridge/Malden, MA: Polity, 2013).

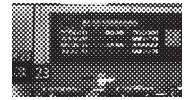
and engender them to prosper in their wealth? We don't want to stand on the shore being scared of the streaming waters, scared of floods. For how could we learn dancing with the waves, surfing, while being scared of the water? There is so much our speech is up to describing, naming, meaning, yielding, arousing. Provided we trust it, let it do it. And at all that, our speech is not innate, but our cultural competence, evolved over time. Once our faith went to speaking mythical bodies, then to the bodily logic of the written, intuitive language, and today it is going to the intuitive functions of a language full of values. Today we are now preparing for the step where we ought to learn to trust the appraisive articulation of the live language.

And marvel at the richness of our means of expression. Through intuitive scripts we expressed the mythical bodies, multiplied them, let cities emerge. Through functioning apparatuses we expressed the intuitive scripts, multiplied them, engendered landscapes, nations, and history. And now through valuing applications we express the functional apparatuses, multiply them, engender climates, life, and the world. We are now able, through photovoltaics, to print energy, because we are able to express it. Our articulations are so very rich. Rich beyond expectations. With processors, we are able to print our logical, analytical thinking, because we are able to express intuitiveness. Any intuitiveness we know, and any that we may be going to know in the future. All we can articulate. Through machines our bodies became explicit and multiply, through the apparatus our motions became explicit and multiply, and we are just now experiencing that through the applications our intuitions become explicit and multiply.

For a long time we followed the shadows of the sun with the nouns of our language and our bodily reflexions; then we brought out the accents of the shadows of the sun with the attributes of our language and our motioned projections. Today we are able to step out of the shadows of the sun, with the verbs of our language and the energized forms of intuition.¹⁰ HELLO SUN. The world shimmers. Ever more.

II ENTHUSIASM

As an architect and IT man I wonder how to design, construct, inhabit these riches. I grew up with the fascination emanating from Fritz Haller's generic node, and in Konrad Wachsmann's tradition. With Buckminster Fuller as a model. Thirty, sixty years on, I have a hard time still finding that fascination. Weak shadows. Functionalism is accused of reductionism. Which itself is now the butt of reductionisms. Understood in this fashion, it is impossible to demonstrate



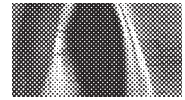
➤ [FIG. 13] P. 63



➤ [FIG. 14] P. 63



➤ [FIG. 15] P. 63



➤ [FIG. 16] P. 63



➤ [FIG. 17] P. 64



➤ [FIG. 18] P. 64



➤ [FIG. 19] P. 64

¹⁰ Cf. Ludger Hovestadt, "A Fantastic Genealogy of the Printable," in *Printed Physics*, ed. Vera Bühlmann and Ludger Hovestadt (Vienna: Ambra, 2012).

exhaustively all of the generic node's qualities. Nor those of structures built with it. But does that then really mean there is not much there? The marveling at, or rather appreciating of, something we created without being directly visible, seems to be on the fade. We are doubting our intellect. Appreciate only what we can touch, what we can see. How may it be considered natural that a screw, lifted from one appliance, can be put into another appliance that will then re-function; that a gramophone can play any instrument, or a telephone transmit any language? That one number can count apples, pears, and birds? That letters may render any word, or script any sentence? Even such as are yet unspoken. Why did we forget that our forebears had different words for either two apples or three apples? They weren't any dumber than we are. And their lives weren't any less rich than ours. But speech, script, numbers, telephoning are cultural inventions, conventions. A bit baffling, this imagining all of it to be simply natural, just lying about somewhere until being discovered one day. Putting on helmets expecting to watch my thoughts. A hundred years ago, they charted faces. Geo-researchers (as earthy and territorial as you can get) were able to prove, or so said the news of August 25, 2011, that bad weather—El Niño in particular—causes civilian wars. While Gaddafi's palace is being stormed in Tripoli. What are we talking? Talking up? "WikiLeaks trusts in the wisdom of the masses." What wisdom? A mean value! Irresponsibly narcissistic rant about our talking. Or the widespread tendency to take the Fukushima nuclear incident for a natural catastrophe. Calculations have been accurate, really. Just the earthquake too strong. And the tsunami synchronous. An unforeseeable set of coincidences.



➤ [FIG. 20] P. 65



➤ [FIG. 21] P. 65



➤ [FIG. 22] P. 65

Why are we so quick to reject responsibility? Whence this lethargy? How could the fascination so quickly be forgotten that these inventions exerted? The imagination they required, and the risks taken? Consciously taken. On account of the fabulousness of possibilities. Somewhat astonishing then this building of metropolises with energy while dumping the risks upon numbers and nature. Not even dreaming of forgoing metropolitan life. Indeed, more of it! Curiosity. I remember vividly how I was unable to sleep one night after I had seen the first color television picture. Just as if it were today. Or perhaps twenty years later, when on a Xerox monitor different texts were flowing in two independent windows. Or my grandfather's typewriter for the few important letters, with the strong odor of cigar ashes between the keys. Carbon paper rustling. The fuzzy copies. What sense does it then make to say: this functions this or that way? No miracle, then! What are you getting worked up about? Take it easy. The things, the thoughts, the talking are well rehearsed. An "a" is written this way, an "f" that way. The word "tree" is spelled with such and such letters. Clauses have a subject, a predicate, an object.



➤ [FIG. 23] P. 66



➤ [FIG. 24] P. 65

It works. Where went the magic of the first letter on the typewriter? The magic of the first letters with the fountain pen? Where did the fascinations, the excitements go? What was being exercised, what had to be exercised? How was it exercised? Who was an expert? What was he up to? Breeding grounds for new, different adventures. What was being pacified? How was it pacified? What fears were allayed? As three hundred years ago? Or five hundred years? The year one is only sixty generations away. My grandfather was born 120 years ago. The Napoleonic wars were a mere eighty years earlier. Not very distant, all this. Almost today.

III STEPPING ON THE BRAKES

Technics accelerate.¹¹ Everything quickens. This we are shouting out against stormy weather, against the climate. We are lodged on the dry dam, sitting in our cosy room, driving in our safe car, watching on TV how the river picks up speed, how the water rises, and we call out to it to slow down please because we are afraid. Striving to put the brakes on the storm, the flood. Talking of financial crises, educational calamities, climate catastrophes, media floods. It is all getting too much. Too rapid. Ease off. Decelerate. Making out the culprits to be the technicians, of all people. The very technicians that for centuries haven't been doing anything but brake, brake, brake.¹² Technics is not the rushing torrent. It is the dam, the safe car. The world rushes, and thanks to technics we managed to pull up this or that dam for channeling, decelerating the stream. Technics does not push. Technics impedes. Water, e.g., evasive, always flowed away. Through technics, we channel it, hold it back. So that we may retain it as long as possible. Agriculture. Settledness. Every ideative line decelerates the flow of what is happening. Every scientific reference point is an anchor for our holding onto within the all-engulfing flow. Alright, we can draw faster with lines; calculate speedier with numbers; and, thanks to logic, argue quicker. Build dams higher. Medially speed up our dialectics and our denouncing of technics-driven acceleration. Forgetting, over our narcissistic inebriation, that our analytical masterstrokes are mere thought figures that revolve around our slowed-down comfort and security systems within which in reality, thanks



➤ [FIG. 25] P. 66



➤ [FIG. 26] P. 66

- 11 E.g. Paul Virilio, *Rasender Stillstand: Essay* (Munich, Vienna: Hanser, 1992). French original: *L'Inertie polaire: essai sur le contrôle d'environnement* (Paris: C. Bourgois, 1990). Or: Jacques Derrida, *Apokalypse*, ed. Peter Engelmann (Vienna: Passagen-Verlag, 2000 [1985]). In English: "No Apocalypse, Not Now," in *Psyche: Inventions of the Other* (Stanford, CA: Stanford University Press, 2007).
- 12 Gilles Deleuze and Félix Guattari, *Was ist Philosophie?* (Frankfurt/Main: Suhrkamp, 1996 [1991]). In English: *What Is Philosophy?* (New York: Columbia University Press, 1994).

to that mastery, very little moves. We take multitude for magnitude,¹³ numbers for quantities, our thinking for real, and are being scared at our own thoughts. As per Jules Vuillemin, above:¹⁴ If synthesis is the method of composition, and the eventuality of the inventing of new truths is to be avoided, then analysis must precede synthesis. That is why Descartes invents a mathematical order stripped of any existence outside of thinking. It is schematical and inapt to let us capture the flow of events. But not inapt to become the foundation of a science. We are all too easily following these well-trod paths—in engineering as well as in arts and humanities. For the technically intuitive speech today leads to formal restraining; the humanistically intuitive speech to structural restraining. Raising to a power and taking a root. On these reduced-speed, sheltered, evened-out tracks (the dams) our arguments and analyses (the flow) run ever faster. And they will proliferate. And grow denser and denser. Networks. Safeguards. Insurances. Infrastructures. Comfort. Sustainability. Dwelling types. Hygienes. Psychoanalyses. Designs. Interfaces. Embodiments. Surveillance. Empathies. Sustainabilities. Breakneck standstill. Entropy. Speechlessness, and agitated talking to no one in particular. Technically functional, or humanistically differentiated. Isolated. Silent. Stiffened. Balanced. Entropy. Because we are bent upon avoiding the invention of new truths. Because we are putting analysis before synthesis.



➤ [FIG. 27] P. 67



➤ [FIG. 28] P. 67

IV BODIES OF THINKING

What are computers and what should they be doing?¹⁵ How to make them available in everyday life? That's our question, of us architects. What can they do that machines can't? They are particularly tiny and rapid machines, or so everybody says. They are too fast, too tiny, and there are too many of them, or so a lot of folks complain. That is practically all there is to hear, besides the unreflecting outpours of the new-technologies champions. Computers are no machines—that's how we are going to put it. Computers are universal machines,¹⁶ or so one often hears. No, we are affirming, that puts it beside the point, they

13 Eudoxos, in chapter V of Euclid's *Elements*, distinguishes between numbers (exactly measurable) and magnitudes (which are not). Also: Augustus de Morgan, *The Connection of Number and Magnitude: An Attempt to Explain the Fifth Book of Euclid* (London: Taylor & Walton, 1836).

14 Vuillemin, *Introduction à la philosophie de l'algèbre*.

15 Echoing Richard Dedekind, *Was sind und was sollen die Zahlen?* (Braunschweig: Vieweg, 1969). In English: "The Nature and Meaning of Numbers," in *Essays on the Theory of Numbers* (Chicago: Open Court Publishing Company, 1901), <http://www.gutenberg.org/files/21016/21016-pdf.pdf>.

16 The term "Turing or von Neumann Universal Machine" is, in the sense described, appropriately used, but is, regrettably, often getting misused in the sense of "general" or "common."

are abstract machines. Now you are overdoing it a bit, you might say. So let us show you where all that leads.

Machines make up the infrastructures of today's world—but we'd speak more appropriately of apparatuses.¹⁷ Bundled potentials, capital, projections. With their aid single projects are being economically, technically, politically balanced toward a common ideational aim.¹⁸ Infrastructures are networks. In individual, specific balance. Infrastructures are stabilizing horizontally. They demarcate themselves territorially. Scientific disciplines, administrations, industries, nation-states. Stabilizing in their internal motion. In relation to their ideals. That's the apparatus-like.

Computers are different. Totally different. In this image of horizontal, territorial, ideal structures, computers are the junctions.¹⁹ Still, they are not—as would be a valve or a pump, an interest rate or a risk, some printed form or instruction, a transformation or a representation—in a functional, ideal, logic relationship with their neighborhood. That's how we'd understand the familiar machines and apparatuses. Computers, however, lend an operational, ideal, logistic access to the whole network. Computers are cardinals, no ordinals. Concepts, not things. Logistics, not logic. No matter what Frege, Russel, and the cyberneticists may say. Computers afford explicit access to the totality of nodes of the network; machines have the explicit access to their immediate neighbors. Through machines, the ideal network is really explicated. It is reality. Through computers, the ideal network is really available. It is an idea. With computers, in each node the net is present as an idea—at the price, however, that it is not materially present. Every concretization, or rather every articulation in an information-technological node, every 0 or 1, indicates—and there our understanding stumbles—that it is not this very concretization that is of interest to us, but the fact that none of all the others are present. Thus we delimit the ideational from the ideal, the concept from the thing, the computer from machines. Thus the computers rest as upright, vertical identities on the functioning, horizontal infrastructures. Machines are no longer the actors of the dramatic thought games of the nineteenth century: theaters, operas, novels, mysteries, journals, reports, geniuses, artists, politicians, scientists, industrialists, bourgeoisie. The machines are now the generically functioning backdrops for the articulations of new actors. New plays on new stages. This openness secures

17 Michel Serres, "Motoren: Vorüberlegungen zu einer allgemeinen Theorie der Systeme," in *Hermes IV, Verteilung* (Berlin: Merve, 1992), 45–91.

18 In both the Kantian and Hegelian sense.

19 Cf. in this context especially the idea of Vilém Flusser's, who characterizes the electronically wired house as a net node. Vilém Flusser, "Die Stadt als Wellental in der Bilderflut," in *Medienkultur* (Frankfurt/Main: Fischer Taschenbuch Verlag, 1997 [1988]), 175–82.

the necessary air for fruitful thinking. Unhurried by the speeding, densifying logics of computers as machines. What might be the new scripts on a new stage? What has been keeping us moving for those past hundred years? Film, publicity, brands? Urban phenomena today, in London, Tokyo, Paris, New York? As well as in Moscow, Beijing, Berlin, Singapore? Delhi, Lagos, perhaps? As in town, as in the countryside? How are we cultivating infrastructures today? Infrastructure as the logical essence of that which we ourselves not long ago called culture.

But let us concentrate upon the body of thinking itself and the movement of inversion described in relation to the slowing-down character of technics, and the streaming happenings of the world. It directly contradicts the notion of cultural or technological progress that so dangerously obstructs our adequately dealing with information technology. We expect these inversions to enable us to cultivate both our familiar and unfamiliar cultural riches. The ideal notion of progress requires functional and logical orientation, following the motto *That's the way to do it*. If, on the other hand, one is able to articulate, in a particular situation, all the ways that it's not to be done, one gains breathing space for the different and gets—with the computers as ideate technical module—operational without being forced to function within the dictates of the technical infrastructures.

Thus encouraged, we shall find without particular difficulties bodies of thinking and inversions in our culture and enjoy a rich and free view. What, e.g., distinguishes Leibniz, in his famous dispute with Newton?²⁰ Leibniz affirms the mathematical articulative forms of his time, applies them infinitarily upon themselves, negates them, and thereby proclaims a new notation and new numbers. With his infinitesimals he creates a new level of abstraction, symbolizes the old procedures, and puts them as figures upon the new-level stage. He calls his new numbers a “mathematical fiction”.²¹ He orthogonalizes the familiar for a new game on a more abstract stage. This is the movement that ought indeed to interest us: in lieu of the notion of progress, the old thinking order is being infinitely self-referentially rethought, inverted, and negatively symbolized. Whereas Newton integrates the new phenomena into the old notation, and then gives a virtuoso performance on the old orthodox stage. With short-lived success. While Leibniz's playing the new stage took some time before breakthrough; under the

20 A. Rupert Hall, *Philosophers at War: The Quarrel between Newton and Leibniz* (Cambridge: Cambridge University Press, 1980).

Jason Socrates Bardi, *The Calculus Wars. Newton, Leibniz, and the Greatest Mathematical Clash of All Time* (New York NY: Thunder's Mouth Press, 2006).

21 On the designation of the infinitesimal as fiction cf. especially no. 6 of Leibniz's letters to Bartholomé des Bosses (1706). Gottfried Wilhelm Leibniz, *The Leibniz-Des Bosses Correspondence*, ed. Brandon Look and Donald Rutherford (New Haven, CT: Yale University Press, 2007).



FIG. 1
Promotional film of
Electricité de France.



FIG. 2
Curios Gallery at the
Oxford University
Museum of Natural
History.



FIG. 3
Troisdorf (1985) by
Gerhard Richter.

FIG. 4
Rice farming in
Japan.



FIG. 5
Wheat farming in
Germany.

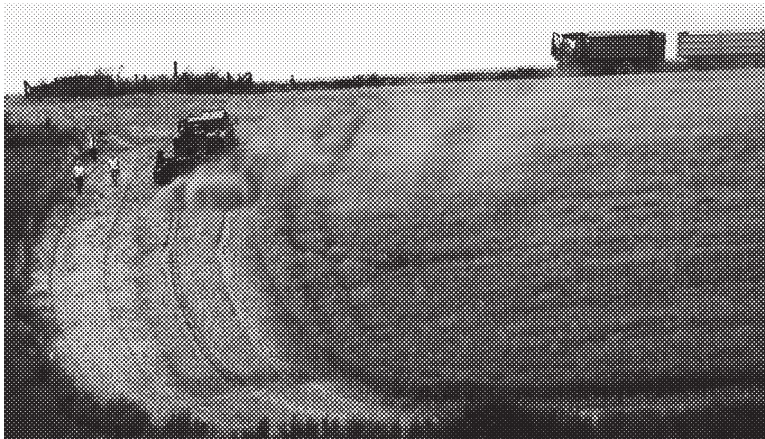


FIG. 6
Fellini, *La Dolce
Vita*.





FIG. 7
Marlboro
advertisement.



FIG. 8
Lol Coxhill.

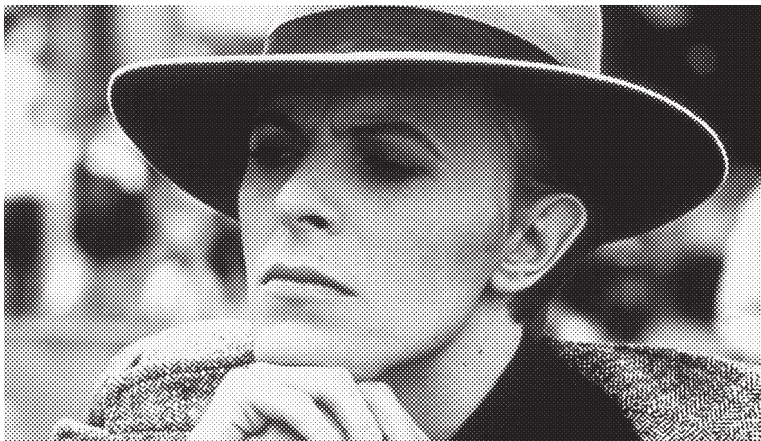


FIG. 9
David Bowie,
*The Man Who
Fell to Earth*.

FIG. 10
Mall facade in
Singapore.

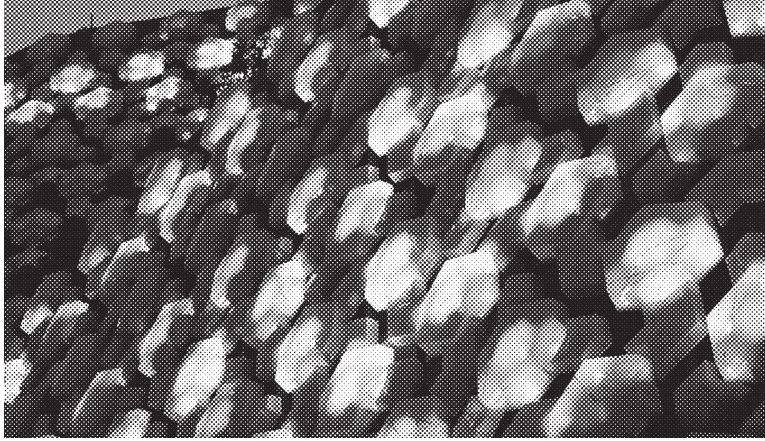


FIG. 11
Play actress in India.



FIG. 12
Airport, Fischli/
Weiss.



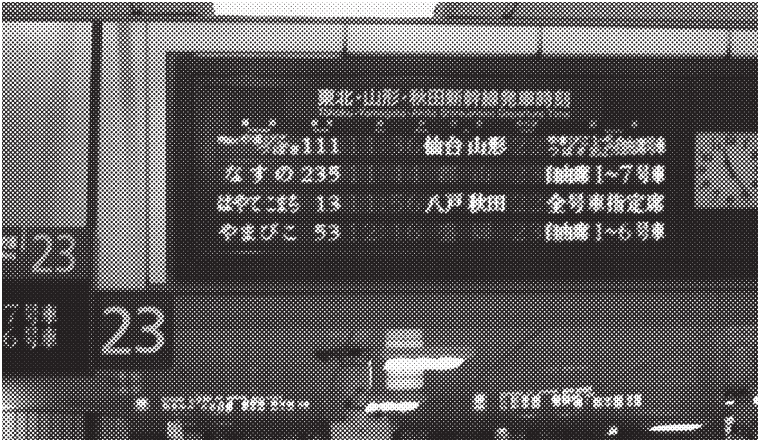


FIG. 13
Subway in Tokyo.

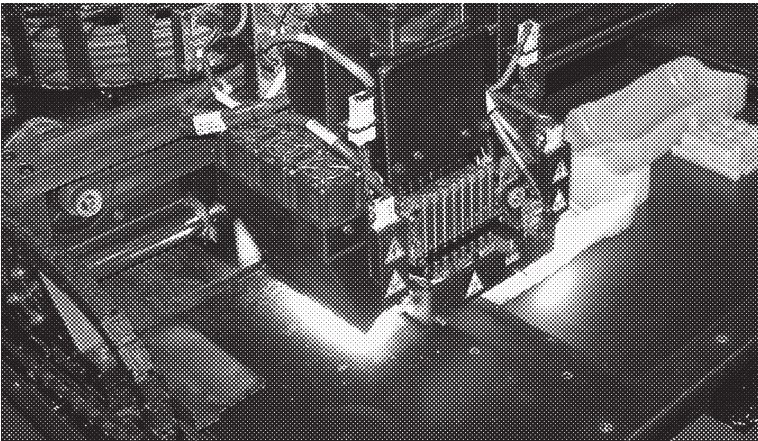


FIG. 14
3-D printer.

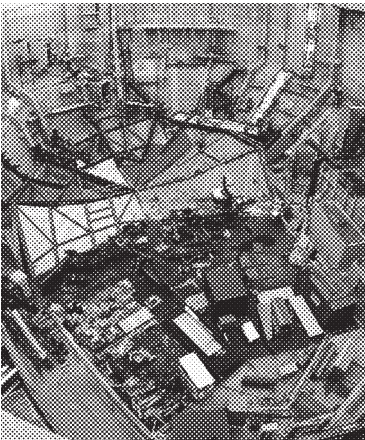


FIG. 15
Elbe Philharmonic
Hall Hamburg,
Herzog & de
Meuron.

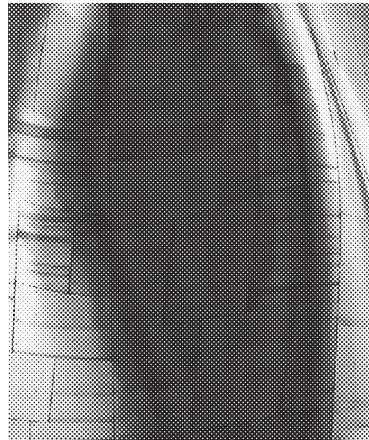


FIG. 16
Guggenheim
Museum Bilbao,
Frank Gehry.

FIG. 17
Will and Jaden
Smith, *The Pursuit of
Happyness*.



FIG. 18
Sunset in Iceland.



FIG. 19
Karlheinz
Stockhausen.



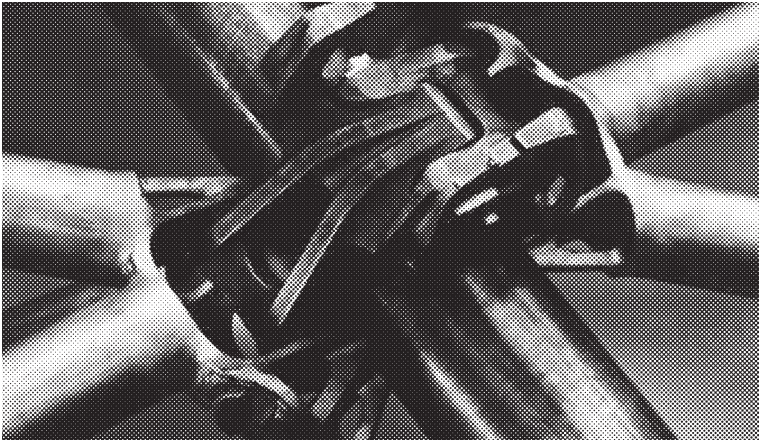


FIG. 20
Konrad Wachsmann.

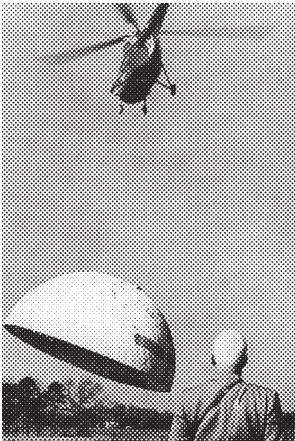


FIG. 21
Buckminster Fuller.

FIG. 24
Alfred Hitchcock
in Think Different
Apple ads.



FIG. 22
Marcello
Mastroianni.

FIG. 23
Douglas Engelbert.

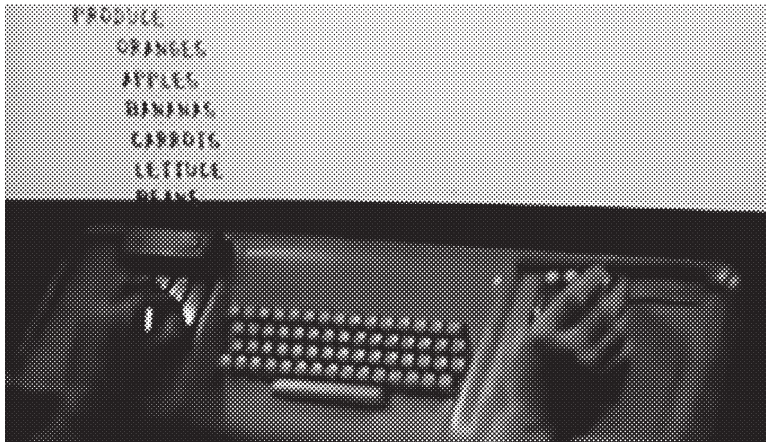


FIG. 25
*The Rider on the
White Horse*, by
Theodor Storm, in
an illustration, 1924.
Individual struggle.

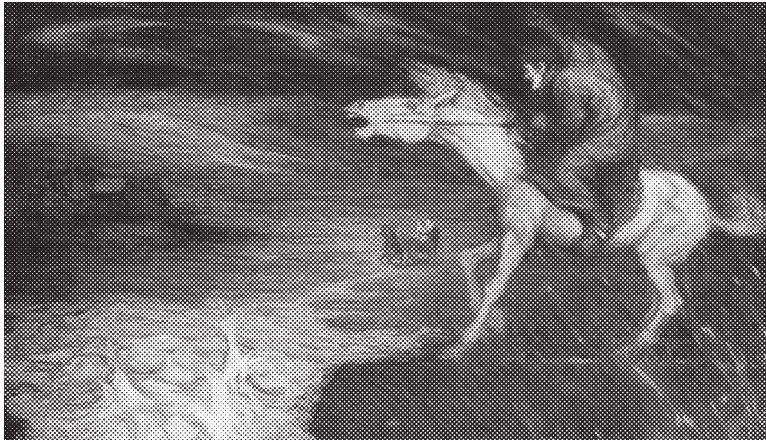


FIG. 26
Der Schimmelreiter.
Film, dir. Hans
Deppe and Curt
Oertel, 1934.
Symbolically drama-
tized didactic play.





FIG. 27
Die Schimmelreiter.
 Film, dir. Lars
 Jessen, 2008.
 Deterritorialized
 schema.

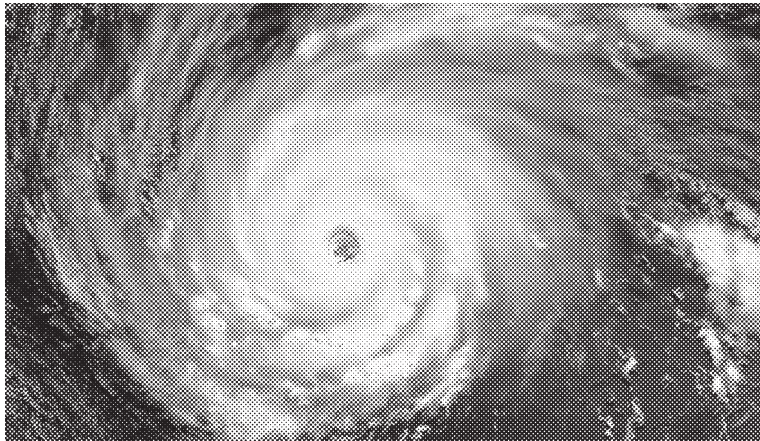


FIG. 28
 Hurricane, a media-
 ized spectacle.

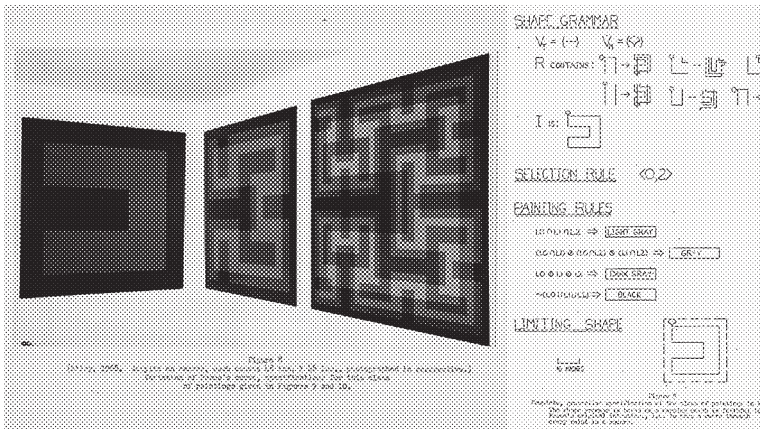


FIG. 29
 George Stiny, Shape
 Grammar, 1972.



FIG. 33
Machine or no machine? Kasparov loses against Deep Blue at chess, 1996.



FIG. 34
What is language up to? Ali G challenges the computer linguist Noam Chomsky, 2007.

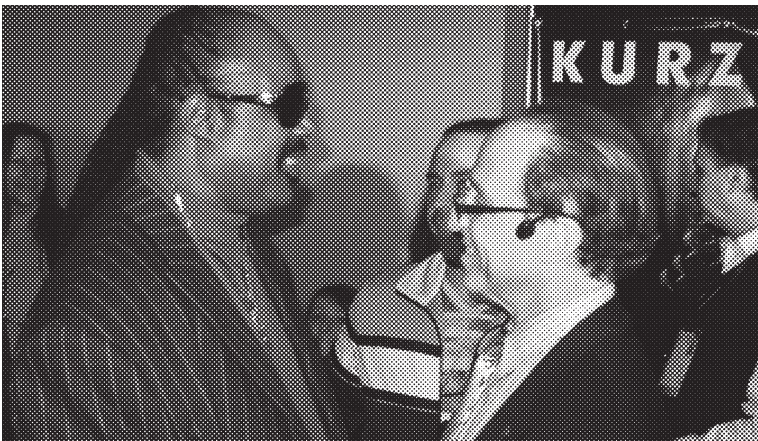


FIG. 35
Stevie Wonder challenges the "symbol-machine builder," Ray Kurzweil.

FIG. 36
What is intelligence,
now? Douglas R.
Hofstadter, 2005.



FIG. 37
The uneasy birth,
coming-out, emanci-
pation from second
nature. *The Matrix*.

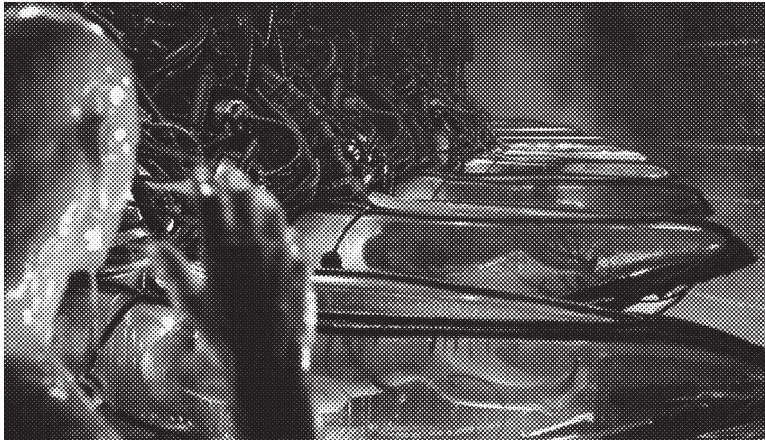


FIG. 38
Strike, by Sergei
Eisenstein.





FIG. 39
Mimic octopus.
Confining.



FIG. 40
Measuring
characters.

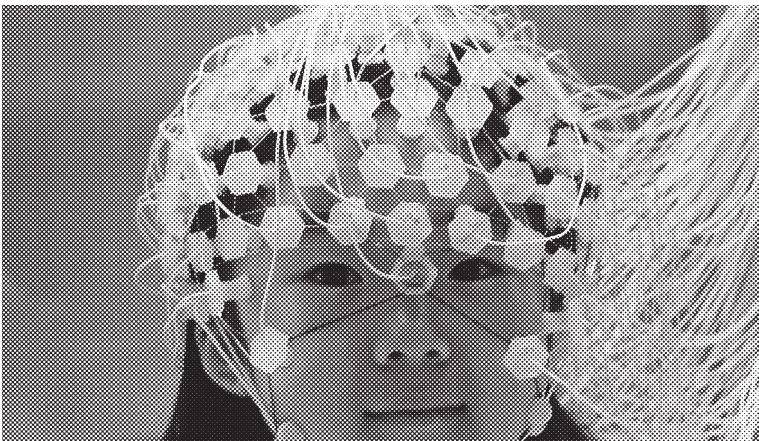


FIG. 41
Thought-reading.

FIG. 42
Bodiless and mind-
less properties.
Clean, unassailable,
efficient. *Terminator*
2, 1991.



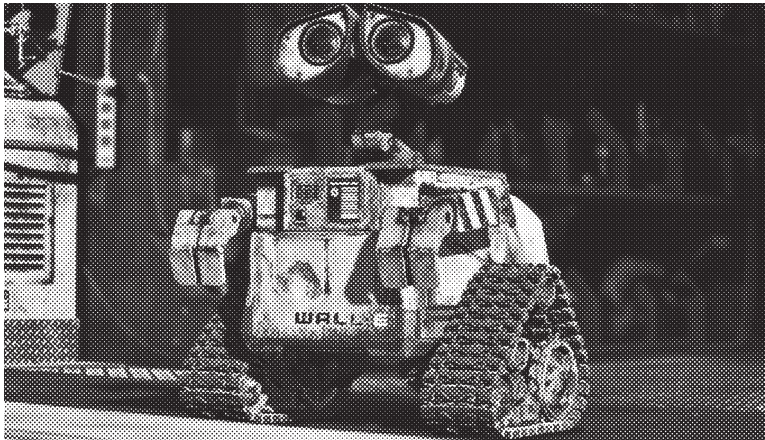
FIG. 43
Simulated evolution
in a video game,
Creatures 3.



FIG. 44
Dr. Strangelove, by
Stanley Kubrick.



FIG. 45
Wall-E. The last man
out cleans up Earth,
2008.



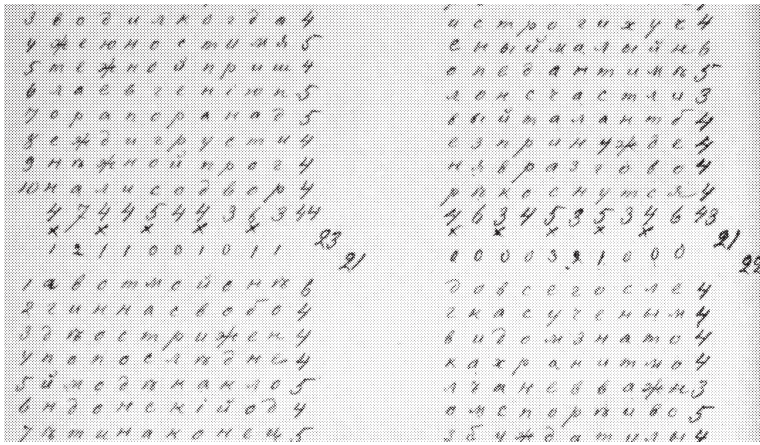


FIG. 46
Markov indexings.

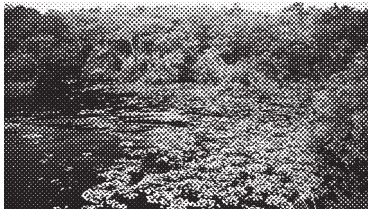


FIG. 47
Algebraic landscape.
Amazonas River
presented by
Greenpeace.

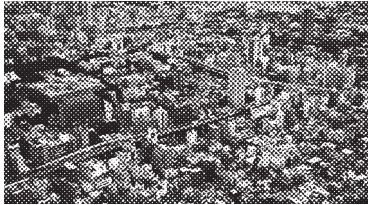


FIG. 48
Tokyo.

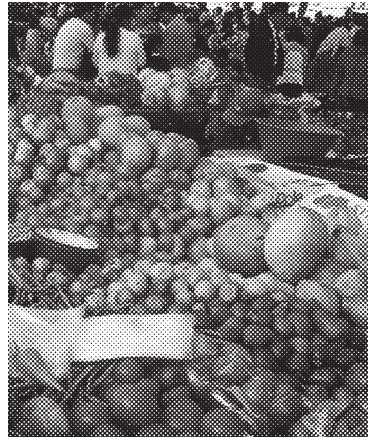


FIG. 49
Ecuador.



FIG. 50
Alain Ducasse.

unceasing and vicious attacks of the standoffish Newton he even lost his reputation for urbanity.

So much so far about the overlaying of stages for the purpose of engendering a new body of thinking. In a first step, let us here characterize succinctly the stages played by Western cultural history. The second part of this text will then do it in more depth.

So what was being performed on the stage of antiquity and medieval times? Who were the actors? What was the scenery? As actors we find *typical characters*: fire, heat, tree, roof, tradesman, prince, priest ... first and second substances²² ... as plays, typical schemata, *topoi*: all humans are mortal, Socrates is human, Socrates is mortal; Minnesong; the estates; the marketplace; bartering; trades ... The scenery: the unmoved mover,²³ the proportion of qualities, movements, and positions of the actors. The module is the plinth. Its magnitude determines the numbers. They, not the magnitude, may be inserted into the proportion, the ratio.²⁴ With this ratio, temples, churches, villas, buildings are being erected in artful systems.

And on the modern-age stage? As actors, we find now calculable properties: motion, power, energy ... first and second substances in new guise ... relationships balanced as stage plays: "When the sun is in the ecliptic, the stars are visible,"²⁵ the individual, health, nature, the landscape, the principality, the bourgeoisie, economy, wealth ... As scenery, the unmoved mover in new guise: the function through which the values of the properties are mutually proportionating themselves. The endless continued fractions of circle calculation or interests are being gathered into new-notational functions. Projects thus possible. Rationality's ratio. Analytical geometry is born. Now apparatuses are being construed within the artful systems of the arithmetic. Intuitive, intertwined, balanced motion lines behind the scenery of things.

Leibniz was first in radically formulating this, along with Spinoza. Against this backdrop, the Cartesian "I think, therefore I am" is a halfway house. As developments showed, it's not all about strapping thinking back into being, it's about the being getting opened up unto speaking. The stage center moves from the basic to the attributed within Aristotle's ontological square. And Newton? With his theorem

22 Aristotle, *Metaphysics*, books 7–9. S. Marc Cohen, "Aristotle's *Metaphysics*," *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Spring 2009 (Stanford CA: Stanford University, 2009), <http://plato.stanford.edu/archives/spr2009/entries/aristotle-metaphysics/>.

23 Aristotle, *Physics*, book 8 and in the run-up to his theology (book 12).

24 Howard Stein, "Eudoxos and Dedekind: On the Ancient Greek Theory of Ratios and Its Relation to Modern Mathematics," *Synthese* 84 (1990): 163–211.

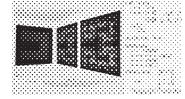
25 Example from George Boole, *An Investigation of the Laws of Thought on Which Are Founded the Mathematical Theories of Logic and Probabilities* (London: Macmillan, 1854). Reprinted with corrections: New York: Dover Publications, 1958.

“A symmetric polynomial in n unknowns can be written in terms of the elementary symmetric polynomials in n unknowns”²⁶ he construes a procedure through which every balanced curve may be subdivided into a sequence of proportions of the old order. How effective in his time, how orthodox from our time!

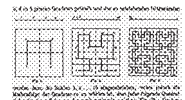
This inversion of the old stage into an upright actor of the new stage, this algebraic embodiment,²⁷ we shall call orthogonalization.

V AGGRESSIVE IGNORANCE²⁸

Before moving on to looking at exercises in how to speak on our contemporary stage, we shall delve into some detail and corroborate our motivation with a number of concrete examples. In 1987 I began as an architect to turn my research seriously toward information technology. Artificial intelligence, shape grammars. Fritz Haller’s perdidifferentiated construction systems as a topic. IT afforded me fascination and easy examples; toys, one might say. As a young researcher one believed of course in those new technologies being applicable to real problems too. But insurmountable difficulties popped up in a hurry, arising from the facile shallowness of the successes of the new technical paradigms. Prime reference, and foundational document of that technology: Stiny 1972.²⁹ A grammar of forms. Fascinating directly in the first games, rapidly frustrating in serious applications. It took me fifteen years to discover and realize the mathematics behind it, and thereby an open discourse and the origin of that technology: Hilbert 1891.³⁰ The same topic and even the same images you produced as an artist, Stiny. Unreferenced. Eighty years earlier than you. And useful for my purpose of modeling architecture in novel fashion. For Hilbert shares the same roots as Fritz Haller’s functionalistic architecture, and is therefore sufficiently differentiated. Indeterminations determine the forms. Your naturalized forms are too simple as starting points. Useless,



κ [FIG. 29] P. 67



κ [FIG. 30] P. 68

- 26 John Derbyshire, *Unknown Quantity: A Real and Imaginary History of Algebra* (Washington, DC: Joseph Henry Press, 2006), 102.
- 27 We are referring to the algebraic fields of group theory, first formulated by Evariste Galois (1811–1832).
- 28 A particular caveat against possible misunderstandings: as may easily be gathered from its argumentations, operational speed is central to this text and this clashes, in practice, with an emphasis on careful analysis. The text therefore relies upon the integrative power of abstraction, and encourages the readers to be attentive to the choice of language, so as to be able to evaluate on their own the degree of credit they may wish to grant the various trains of thought. And once again: we’ll argue forcefully, differentiate clearly, but reject any attempt to have judgments read into the text.
- 29 George Stiny and James Gips, “Shape Grammars and the Generative Specification of Painting and Sculpture,” in *Proceedings of IFIP Congress 1971* (Amsterdam: North Holland Publishing Co., 1972), 1460–65. Republished in Orlando R. Petrocelli, ed., *The Best Computer Papers of 1971* (Princeton, NJ: Auerbach, 1972), 125–35.
- 30 David Hilbert, “Über die stetige Abbildung einer Linie auf ein Flächenstück,” in *Mathematische Annalen* 38 (Leipzig: Teubner, 1891), 459–60.

Stiny. Formal analysis as an architect's starting point? Catastrophic. Hilbert's discourse is vaster, offers an out, is up to assisting me as a researcher. Analysis and synthesis in one. Why, Stiny? Why this ignorance? Why this reduction? Why did you block that path? Just as most of your colleagues, by the way. Whence this aggressiveness against the rich body of thinking from which our technologies have sprung?

The quest is thus ongoing for similar, serious games, thrust unchanged: Charles Percy Snow, in his much-noticed book *The Two Cultures and the Scientific Revolution*,³¹ in 1959 describes the clash between the humanities and natural sciences. He laments one-sided syllabi, the impoverishment of those two scientific cultures, and tries to uncover a third culture. And then, a mere thirty-six years later, in an interesting twist, John Brockman's answer, *The Third Culture*:³² a gathering of cyberneticists and constructivists proclaiming the passing of the Snow-bemoaned cultural starvation, with the following script: Chapter 1—The Evolutionary Idea. (An interesting idea.) Chapter 2—A Collection of Kludges. (A cute show of positivist acrobatics.) Chapters 3+4—Questions of Origin. (Things are getting serious.) Chapter 4—What Was Darwin's Algorithm? (The machine.) Chapter 5—Something That Goes beyond Ourselves. (Submission.) This openly pragmatic reduction to technical representation now is the diametrical opposite of the Snow-postulated openness, while being symptomatic for today's situation: as long as airplanes fly, as computers are getting ever faster, DNA sequenced ever speedier, automobiles ever safer, GPS ever more precise, brain scans ever more colorful, conferences ever larger, and the images of the complexities and emergencies ever more alike ... we fall into one another's arms ... who cares ...

Therefore, let us put the question a bit differently: what is intelligence? In 1950 the eccentric mathematical acrobat and crypto-analyst Alan Turing proposes a test:³³ there is intelligence when after



κ [Fig. 31] P. 68



κ [Fig. 32] P. 68

- 31 Charles Percy Snow, *The Two Cultures* (London: Cambridge University Press, 2001 [1959]).
- 32 John Brockman, *The Third Culture: Beyond the Scientific Revolution* (New York: Simon & Schuster, 1995). Here a picking of articles from Brockman's opus—a cabinet of algorithmic delusions of almightiness: George C. Williams, "A Package of Information." Stephen Jay Gould, "The Pattern of Life's History." Richard Dawkins, "A Survival Machine." Brian Goodwin, "Biology Is Just a Dance." Steve Jones, "Why Is There So Much Genetic Diversity?" Niles Eldredge, "A Battle of Words." Lynn Margulis, "Gaia Is a Tough Bitch." Marvin Minsky, "Smart Machines." Roger Schank, "Information Is Surprises." Daniel C. Dennett, "Intuition Pumps." Nicholas Humphrey, "The Thick Moment." Francisco Varela, "The Emergent Self." Steven Pinker, "Language Is a Human Instinct." Martin Rees, "An Ensemble of Universes." Alan Guth, "A Universe in Your Backyard." Lee Smolin, "A Theory of the Whole Universe." Paul Davies, "The Synthetic Path." Murray Gell-Mann, "Plectics." Stuart Kauffman, "Order for Free." J. Doyne Farmer, "The Second Law of Organization." W. Daniel Hillis, "Close to the Singularity."
- 33 Graham Oppy and David Dowe, "The Turing Test," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Spring 2011, <http://plato.stanford.edu/entries/turing-test/>.

multiple questioning it is impossible to tell whether one is in presence of a person or an algorithm answering. Turing's prognoses are prudent. He doubts that within a foreseeable future machines might be able durably to deceive man. And indeed, progress was even less than predicted by Turing. But anyway the question about intelligence must be put differently. For our colleagues of the third culture have given the answer long ago: we are algorithm. And in 1952, prior to our colleagues, Turing himself, with the term "morphogenesis,"³⁴ lays the foundation of that theoretical biology which so fascinates the cyberneticists.

And so on: 1966. Joseph Weizenbaum's artificial psychotherapist Eliza admirably performs his task:³⁵ although the subjects know that they are in face of an algorithm, they in their majority feel understood. In 1968 Philip K. Dick inverts the question of machine intelligence in his novel *Do Androids Dream of Electric Sheep?*³⁶ (turned into the film *Blade Runner* in 1982). Now androids are fighting for emotional liberation and against the so-called Voight-Kampff test. They are up against the test. They refuse to be tested.

Today with the algorithms of Google and Siri the intelligence question is out: we are no longer testing the algorithms, we are continuously testing ourselves.

We are going to take the Turing-test question as being a suggestive one. The "not yet (intelligent, rapid, precise) enough" and the "but soon (intelligent, rapid, precise) enough," so often heard, raises, on the stage of intuition, the question about intuitiveness itself. And in Turing's case, the algorithm principle is being naturalized in this self-reference. In the well-worn analytical manner. While today we are playing a new, more abstract stage. For some time already. At least since 1870.

Yet such foreshortening of cybernetics: in 1965, e.g., Gordon Earle Moore, one of Intel's cofounders, spells out the eponymous Moore Law according to which IT performance doubles every 18–25 months,³⁷ which works out to a factor of 60 after 10 years, one of 10,000,000 after 40 years, i.e. 2005. Impressive! Great as a business model for Intel. And it actually did turn out that way. But for this calculation being of little use to anyone other than Intel. Because what Intel is printing are no machines, nothing to be intuited. It is—as described above—abstract

34 Alan M. Turing, "The Chemical Basis of Morphogenesis," in *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences* (1952): 37–72.

35 Joseph Weizenbaum, "ELIZA - A Computer Program for the Study of Natural Language Communication between Man and Machine," in *Communications of the ACM*, 9.1 (New York: ACM, 1966). On the Internet, several online versions of ELIZA are available.

36 Philip K. Dick, *Do Androids Dream of Electric Sheep?* [1968], SF Masterworks series (London: Victor Gollancz, 2010).

37 Gordon E. Moore, "Cramming More Components onto Integrated Circuits," in *Electronics* 38, no. 8 (1965): 114–17. Also: http://download.intel.com/museum/Moores_Law/Articles-Press_releases/Gordon_Moore_1965_Article.pdf.

machines upstream of any possible intuitiveness. Thus, those at first sight impressive numbers are tantamount to evaluating books by their weight or number of characters. And in actual fact, it did turn out differently from what the intuitive message of the numbers suggests. Whereas in the sixties and seventies the talk was of a few computers as large as houses, and in the eighties and nineties of billions of personal computers with a new set of applications, today we are looking at trillions of links presented worldwide by Google et al. Each time our work and life modes changed. Each time our mode of coexistence with the respective technology changed. Unexpectedly. Overtly. Each time, against any predictions, there were dramatic market upheavals and weighty new players: IBM, Microsoft, Google. Thus Moore's law does not mean much, and is in particular unable to predict qualitative changes in information technology. But suggests intuitively that of course everything is under control.



κ [FIG. 33] P. 69



κ [FIG. 34] P. 69



κ [FIG. 35] P. 69



κ [FIG. 36] P. 70

The rift between the protagonists of the first computers and computer use today is vividly exhibited in a 2007 YouTube interview with Sacha Baron Cohen, alias Ali G., and Noam Chomsky.³⁸ The linguist and information technologist of the eighties, and the new-millennium comedian. Baron Cohen incomprehensible to Chomsky. Chomsky medialized. Google vs. IBM. An interesting play on different stages.

Or: why did in 1996 IBM's Deep Blue for the first time manage to beat Garry Kasparov at chess?³⁹ The algorithms won because they had given up trying to understand chess analytically. Symbolic algebra, probabilistics, abstraction from any visuality. Quitting of the analytic stage. Memory capacity and processing speed over any contextual contention and meaning. Exit the power of analysis. Welcome to the new stage of nontrivial questions.⁴⁰ Let's not forget: Hilbert's program was sunk by Gödel. We'll have to take this seriously. Logic and calculability today are backdrops to the play of another music.

Or another story in the same language game: in 1976 Ray Kurzweil develops a language synthesizer based on samples, symbolized recording fragments that may, irrespectively of what they contain and mean, be cobbled together at will.⁴¹ Synthesis unprecedented by analysis. The two are players in a reciprocal game. It is no more about breaking acoustic phenomena down into primary wave forms and then synthesizing them. It is no longer about the question about what language, or

38 "Ali G. and Noam Chomsky Discuss Language," *Write Now Is Good*, January 26, 2007, http://writenowisgood.typepad.com/write_now_is_good/2007/01/ali_g_interview.html.

39 "Deep Blue," online article: <http://www.research.ibm.com/deepblue/learn/html/e.shtml>.

40 cf. Kurt Gödel's insight that only trivial problems can completely be described algorithmically.

41 Aaron Kleiner and Raymond C. Kurzweil, "A Description of the Kurzweil Reading Machine and a Status Report on Its Testing and Dissemination," *Bull Prosthet Res*, 10, no. 27 (Spring 1977): 72–81.

music, is, but about how to break them down and what then to do with the fragments. Written text may be recited by a machine or, together with blind Stevie Wonder, drawn by the fascination of the language synthesizer, be put into new music. 1982, Kurzweil Music Systems. Exactitude of analysis of language or music, and comprehension, give way to questions of memory capacity and processing speeds, and the know-how in dealing with initially arbitrary symbolizations. A new music begins to emerge.

Kurzweil today is first a prominent futurologist. In his *The Singularity Is Near*⁴²—the very term is suspicious, threat and solution/salvation in one—he relies mainly upon decomposition of essential cultural phenomena, setting their quantities off against information technology's exponential growth in genetics, nanotech, robotics. Extending Moore law, he announces the "Law of Accelerating Returns,"⁴³ according to which, in keeping with the Kurzweil Music Systems evolutionary scheme, not only quantities would grow exponentially, but qualities as well. So far, so good. Analytics generates quality. Dissolution of arbitrary technical symbolizations is capable of addressing ever more complex trivial problems.⁴⁴ Thereby, however, he falls to the cybernetic error that inventions and knowledge precisely are no qualities. And are non-trivial. Whence he is ending up with the breathtakingly reductionist need of a new ethic, to be based on the foundations of "mutual respect." In a world of exponentially increasing quantities and qualities, this is a position of hyperbolically decreasing personal independence and exponentially increasing subservience to technology. A deeply religious position, as we would say. Kurzweil overlooked or discarded the active and inquisitive design with the symbolizations that were required for breathing life into his abstract musical instruments. Over his simple proportional numbers games, he repressed or forgot Stevie Wonder's constitutive role in the development of his synthesizers. Which is reflected in Greg Ross's drastic criticism leveled at Douglas R. Hofstadter, the refined aesthete: "It's as if you took a lot of very good food and some dog excrement and blended it all up so that you can't possibly figure out what's good or bad. It's an intimate mixture of rubbish and good ideas, and it's very hard to disentangle the two, because these are smart people; they're not stupid."⁴⁵

Quite a mess therefore on the analytical stage today. Cleaning up won't do. Nor will criticism. The wrong play on the wrong stage, is our point. For

42 Raymond Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Viking, 2005). Also: *The Age of Spiritual Machines* (New York: Penguin, 1999); and: *The Age of Intelligent Machines* (Cambridge, MA: MIT Press, 1990).

43 Raymond C. Kurzweil, "The Law of Accelerating Returns," in: *Kurzweil Accelerating Intelligence*, March 7, 2001, <http://www.kurzweilai.net/the-law-of-accelerating-returns>.

44 Again, in the sense of Gödel 1931.

45 Greg Ross, "An Interview with Douglas R. Hofstadter," *American Scientist*, August 28, 2008, <http://www.americanscientist.org/bookshelf/pub/douglas-r-hofstadter>.

today we are actually playing on a new stage. No longer on the analytic one of Descartes, Leibniz, Lagrange, Hegel. ... Whence all those confusions.

VI ON TODAY'S STAGE

So we are going to inquire about today's stage, ready to learn from the ones of our forebears so as to find stabilities on today's, and avoid daftly and ignorantly reviving the old plays on a new stage. So let us take a closer look (with even more detailed explanations to follow in the second part of this text).

On the modern-age stage the attributable properties were playing and not, as in antiquity and scholasticism, the things. On stage these properties were vested with values. With the values, the properties were proportioned into things.

Newton ascribed proportioned values to the spatial properties of a falling apple, so as to be able to stage the movement not just of the falling apple but of the planets as well (1687). The fix, however, is that the apple must already be falling, and the planets revolving, if values are to be ascribed to properties, and properties to be proportioned. A motion with the motion. But what if one were not to extrapolate a movement, but to predict one? How about a pile of apples? How will they move if one pulls one of them out? Here Euler, Bernoulli, and especially Lagrange offer a continuation: he shakes the apples infinitesimally, a motion without motion, in order to ascertain which values may after all be ascribed to which properties. Whereas in Newton's case the properties are thought before the values, Euler, Bernoulli, and especially Lagrange turn things on their head. In the first place, the many values are being generated, in order to be able then to find appropriate properties with which to perform the proportionalities act (1754). Newton's proportionalities become potentialities.

Likewise Kant 1781: with him, the Aristotelian categories mutate to schemata. He designs a mechanism that—still against the specific background of space and time—lets originate the non-based (the properties) on the basis of the expressed (the values). Hegel (1806) shifts Kant's transcendence into the world as a political reality: properties become vectors which grow the more potent and powerful the better they are able to bundle the values. Things become automatons and apparatuses. Infrastructures grow as potent bundlings of Eigen-vectors: bureaucracies, historiography, novels, nation-states, chemistry ...

The analytical stage thus gets populated toward the mid-nineteenth century. Anything is linkable to anything, which increases the vectors' power. Along with industrialization and the advent of the nation-states, unthought-of potentials appear. In the tail phase we discover various approaches to how to deal with the stage as a whole, how to

deal with potentiality. Now the interesting questions relating to generating the new stage come up, now orthogonalization of the analytical stage sets in.

Let us start with a prominent position (things may get a bit tricky around this heated topic, but let us have a go at it; at least we may see which way to turn our thinking): Marx finds himself in a situation where the capital and its apparatus-like manifestations supply the soil for his dramatically narrated blowing up of interest cultivation into industrial landscapes.⁴⁶ Landscapes in which harvests are apparatus-like tied back to the capital, i.e. the apparatus-like soil of these landscapes. Outrage, in today's view totally understandable, about the primacy granted this apparatus-like soil in the face of the mean treatment of man. Not capital (the horizontal soil) but labor (vertical cultivation)—at the time widely treated as a property of the soil—was declared to be the origin of wealth. Outrage of an enlightened individual at the tightness of that apparatus-like stage, outrage at being treated as property. Marx very radically and prominently places labor (vertical activity) ahead of capital (horizontal, balanced, and attributable properties). And here he turns the prevailing body of thinking inside out: he grabs vertical labor, takes it as infinite, and inverts it into worker identity. A new play, on a new stage. No more bundling of properties into individuals. Now activities bundled into identities. According to Marx, worker identity as a new symbolic soil. Justice, brotherhood, equality are no longer an ideal goal but an ideational constitution, backdrops to a new game.

In Marx's case, however, this new worker-identity scenery is of rather banal design and antiquated execution. What were the props of that time: we got rational logic and magnitudes, in modern times converted to rationality, and in which we talk of multitudes and potentials. And we got the turning of potentials into potentialities. And we no longer speak of individuals but of identities. So how is Marx distributing his late-modern-times potentiality that imposes itself through rationality? The interesting part is that, far from cultivating the potentiality-assailed, over-ripe rationality, he first—as a peasant would do with a new field—clears it until nothing is left. While exhausting himself over it. Such clearance happens in two directions. The horizontal infrastructures of his time, the actual potentiality of the industrial, political, middle-class society is being reduced to ratio, the magnitude of the aristocratic soil. It is being dispelled from rationality, chained into ratio, and thereby intellectually, technologically, and economically emasculated. The worker's vertical identity

46 Karl Marx, *Capital [Das Kapital]*, vol. 1 (Hamburg: Otto Meissner, 1867), trans. Samuel Moore, Edward B. Aveling, and Friedrich Engels (London: Swan Sonnenschein, Lowrey, 1887).

however, which ought to bundle the potentialities based on functioning infrastructures, is being tied back, through the notions of equality and justice, into the analytical potential that a moment ago he had cleansed of the bourgeoisie. So Marx is tying rationality into ratio, and potentiality into the potential of some cleansed rationality sans ratio, thus robbing his symbolic identity, the worker, of any life at all. What we are in effect getting with the *Internationale*, is a global system made up of pure multitude. A self-referential logical-numbers game of distribution, on the symbolic level dangerously primed through repressed potentialities, and—within the powerful technologies and bureaucracies of the time—entirely uncoupled from any proportion and ratio. The justice ideal symbolized into totalitarian equality with no components of intention. An ultimate disposal site for rationality. A first play on the new stage. Without history, without future. Astonishing that the like of it managed to be staged with such power.

Same time, different approach: Boole 1854.⁴⁷ Instead of enclosing the potentiality of his time in labor and capital, he encapsulates it in 0 and 1, and instead of balancing it arithmetically, he renders it, through a new algebra, operable on a new stage. And in opposition to Marx's determining the properties, and proportioning and rationally fixing all values, Boole on principle keeps his properties open. To Boole, the values of 0 and 1 mean the basic indetermination of properties. For the first time, therefore, his algebra is able to value not the basic properties, the first substances, the instances, but the nonbasic properties, the second substances, the concepts, the notions. And so he is able to name his algebra "An Investigation of the Laws of Thought." And on the post-analytical stage, properties are no longer the actors allotting values to themselves, but the values themselves as actors allot probabilisms to themselves. Thus we are no longer playing on a stage of proportionalities, but of potentialities.

Something comparable may be found in Dedekind 1872,⁴⁸ and his concept of continuity and the cut, which replaces the rational infinite that since Descartes and Leibniz was constitutive for analysis, and simultaneously, with the real numbers, opens up a new numbers space. What is the idea? The infinite lines, the analyses are not closed. Indeed, they are infinitely filled, but not closed. The rational circumstances always are isolated points. Dedekind now charges each of these isolated points through infinite polynomials—i.e. with indeterminate potentiality through which the points may adapt themselves mutually toward concrete potentiality in a continuum, according to

⁴⁷ Boole, *An Investigation of the Laws of Thought*.

⁴⁸ Richard Dedekind, *Stetigkeit und irrationale Zahlen* (Braunschweig: Friedrich Vieweg und Sohn, 1872).

the concept of e.g. the eliminatory process.⁴⁹ Thus, intensive orders—second substances—may, prior to any extensive potentiality—i.e. first substances—be algorithmically articulated. This is the new stage of potentialities. It allows operating with notions and concepts before they get concretized and also without them ever having been concretized before. While on the potentialities stage properties were concrete and could be “contrived” by way of models and constructs, now values are concrete, and properties are being “contrived,” by way of articulations. Along with this new stage, Bernhard Riemann’s non-Euclidian geometries are originating, which have become so important to today’s architecture. And there evolves a numbers concept into which, even today, we let ourselves be drawn with such great difficulty: “Numbers are free creations of human mind; they serve as the means for easier and sharper apprehending the diversity of things. It is only through the purely logical process of building up the science of numbers, and by thus acquiring the continuous number domain, that we are prepared accurately to investigate our notions of space and time, by bringing them into relation with this number-domain created in our mind.”⁵⁰

VII BACK-COUPINGS TO A THIRD REALM

So much for the setup of the new potentialities stage. Now a few orthodox retroversions: Cantor (1895),⁵¹ e.g., in his set theory distinguishes ordinals (the actual enumeration of the elements of one set) from cardinals (the totality of elements of a set), but does not, as Boole or Dedekind do, treat the cardinals as second substance, as an indeterminate set, i.e. a quantity whose ordinals, while implicated, are not explicated but explicit as prime first substance and thereby within the scope of the familiar arithmetic, the potentialities, and analyses. In similar fashion, Gottlob Frege (1879)⁵² ties pure thought



↖ [FIG. 57] P. 70



↖ [FIG. 58] P. 70

- 49 We are referring to a mathematical development that found a conclusion of sorts in Carl Friedrich Gauss, “Disquisitio de Elementis Ellipticis Palladis ex oppositionibus” [1811], *Astronomische Abhandlungen (Werke)* (Göttingen: Dieterich, 1865). Section 13: 20–22. Trans. H. F. Trotter. Technical Report No.5, Statistical Techniques Research Group (Princeton, NJ: Princeton University, 1957), <http://www.york.ac.uk/depts/maths/histstat/gausspallas.pdf>.
- 50 Richard Dedekind, *Was sind und was sollen die Zahlen?* (“The Nature and Meaning of Numbers,” in *Essays on the Theory of Numbers*).
- 51 Georg Cantor, “Beiträge zur Begründung der transfiniten Mengenlehre,” 1. Artikel, in *Mathematische Annalen* (Leipzig: B. G. Teubner, 1895), 481–513; *Contributions to the Founding of the Theory of Transfinite Numbers*, trans. Philip E. B. Jourdain (La Salle, IL: Open Court Publishing, 1915).
- 52 Gottlob Frege, *Begriffsschrift. Eine der arithmetischen nachgebildete Formelsprache des reinen Denkens* (Halle a. S.: Louis Nebert, 1879). Gottlob Frege *Die Grundlagen der Arithmetik: Eine logisch mathematische Untersuchung über den Begriff der Zahl* (Breslau: Wilhelm Koenner, 1884). Gottlob Frege, “Function und Begriff,” lecture held on January 9, 1891, at the Jena Society for Medicine and Science (Jena: Hermann Pohle, 1891).

back into an arithmetic system of notation (predicate logic). Brought to prominence especially through Whitehead and Russell (1910),⁵³ it is an attempt at visualizing thought, at reverting intentionalities back to the stage of potentialities. In 1918, Frege speaks of a “Drittes Reich.”⁵⁴ Next to the realm of “subjective representation” and the realm of “objective–real” physical objects, he postulates a third realm of “objective–non-real” thoughts, as basis of a logical-technical performance that is neither subjectively nor objectively controlled. A life of rational thinking of its own, with its technocratic and bureaucratic implications, without body and without intellect. In this short-circuit of intentionalities the national-socialists are winning power, gaining their potentiality. Arthur Moeller van den Bruck, in *Das Dritte Reich* (1923),⁵⁵ spells out the same train of thought, not as compellingly but louder. It is astonishing that Ernst Bloch (1935) credits the populist Moeller with the term “Drittes Reich,” remaining thereby within the apparently intuitive, rather than in the repressed intentionality of many of his colleagues.⁵⁶

All the while, the articulations on the new stage of intentionalities went on: around the turn of the century, there came the “Crisis in Intuition.”⁵⁷ Hilbert in 1928 very prominently spells out the decisional problem: Is it possible, in intuitive mode, to think, determine rationally the next step, or predict the next event? Gödel (1929):⁵⁸ only in trivial problem fields.

- 53 Alfred North Whitehead and Bertrand Russell, *Principia Mathematica*, 3 vol., (Cambridge: Cambridge University Press, 1910, 1912, and 1913).
- 54 Gottlob Frege, “Der Gedanke: Eine logische Untersuchung,” in *Logische Untersuchungen*, ed. Günther Patzig (Göttingen: Vandenhoeck and Ruprecht, 1966), 50–53. Trans. “Thought: A Logical Investigation,” in *Logical Investigations*, ed. Peter Geach (Oxford: Blackwell, 1975).
- 55 Arthur Moeller van den Bruck, *Das Dritte Reich* (Berlin: Ring Verlag, 1923. *Germany’s Third Empire*, trans. (condensed) by E. O. Lorimer (London: George Allen & Unwin, 1934). Moeller turns the Christian medieval term “Third Reich” (third age: cf. Joachim of Fiore) into a political one and spreads it in völkisch-nationalistic circles, the First Reich to refer to the Holy Roman Empire of the German Nation, and the second one to the German Empire under Bismarck, while the yet-to-come Third Reich was to be founded on an amalgam of nationalism and socialism. The term harks back to the three eras or ages and, within those, to the “Age of the Holy Spirit” of the medieval mystic Joachim of Fiore (Gioacchino da Fiore, 1135–1202), who predicted the advent of a third age or empire, of pure spirit, after those of God the Father, and the Son. Joachim’s empire notion had already influenced the German Idealists, who perceived in it a philosophical ideal realm in which the dichotomy between the material and spiritual world would be absorbed, or synthesized into a higher “third” one. Moeller applied this Hegelian idea to the synthesis of conservatism and revolution, nationalism and socialism. Cf. wikipedia.com.
- 56 Ernst Bloch, “Zur Originalgeschichte des Dritten Reichs,” in *Erbschaft dieser Zeit*, complete edition vol. 4 (Frankfurt/M.: Suhrkamp, 1977 [1935]), 126–60. *Heritage of Our Times*, trans. Neville and Stephen Plaice (Cambridge: Polity Press, 1991).
- 57 Hans Hahn, “Die Krise der Anschauung,” in Hermann F. Mark, *Krise und Neuaufbau in den exakten Wissenschaften: Fünf Wiener Vorträge* (Leipzig et al.: Deuticke, 1933) 41–64.
- 58 Kurt Gödel, “Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme,” in *Monatshefte für Mathematik* 38 (Leipzig: 1931): 173–98.

Therefore there was assiduous trivializing in order to drive the symbolized potencies catastrophically into war. Yet all this did not keep some, e.g. Karl Popper, from introducing, as late as 1972 (!), a three-worlds theory,⁵⁹ in which, along with physical and mental objects, objective knowledge too becomes real. His argumentation, in his Tanner lecture of 1978, is nothing short of breathtaking: he sucks all air out of things, naturalizing all artifacts. “But [Beethoven’s] Fifth Symphony as such just does not exist; although, admittedly, we often use language in such a way that we speak of the Fifth Symphony as if it were one of the existing things.”⁶⁰ Welcome to the third culture in the Third World.

VIII WAYS OUT OF SECOND NATURE

In any event, after the World War, and in reaction to it, positions as held by European technocratic bureaucrats and American militaristic pragmatists seem to be the predominant ones. Two primary varieties of international stage play in case one is capable of everything, but at a loss what to put on. Distancing oneself, as a person, frightenedly from the violent potentialities and might. Delegating responsibility to the “objective–non-real” of logic algebra. Safely nestled in the supply, security, and design systems. In the global technical infrastructures and their schematic media-like stagings. A second, animated, technical nature. Shapeless. Mindless.

And then an example of a rather European attitude: in 2000, Hardt & Negri publish *Empire: Globalization as a New Roman Order, Awaiting Its Early Christians*,⁶¹ which Slavoj Žižek described as an attempted “communist manifesto of the twenty-first century.” Back-couplings on all levels, but without doing damage to the prominence of the argumentations. The very same paradigm as Marx 130 years earlier. Instead of workers, now creatives. Instead of capital, now Empire. Instead of *Internationale*, now multitude. The same way as, then, worker productivity was being proportioned, now creativity gets proportionally mensurated and naturalized. Potentiality—now the Empire—is being stigmatized. Scenarios of dissolutions contrived, often with justified outrage: nation-states, wars, prisons, big business ... vanish in proportional balance. Equality. Liberation! In second nature. In multitude. Mechanically. Blind to any potentiality, to new concentrations, to other

59 Karl R. Popper, *Objective Knowledge: An Evolutionary Approach* (New York: Oxford University Press, 1972).

60 Karl R. Popper, “Three Worlds,” in *Tanner Lecture on Human Values*, University of Michigan, April 7, 1978, <http://www.tannerlectures.utah.edu/lectures/documents/popper80.pdf>.

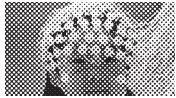
61 Michael Hardt and Antonio Negri, *Empire: Globalization as a New Roman Order, Awaiting Its Early Christians* (Cambridge, MA/London: Harvard University Press, 2000).



κ [FIG. 39] P. 71



κ [FIG. 40] P. 71



κ [FIG. 41] P. 71

stabilities that emerge. In lieu of emancipation of the working class, magnitude is now to come to terms with itself and shed the parasitic Empire, the potentialities. All this in enforcement of three rights: world citizenship, social salary, and reappropriation. Homogenizing—sterilizing—hygiene. Homogenized global magnitude—mechanistically self-absorbed—impotent—silly. How come the schemata of thought are being denied significance? Which is granted only to mechanics? That now creativity is being mensurated, after the mensurating of work proved a flop? How is it possible to ignore that totalitarian mensuration had catastrophic consequences? How can one believe oneself able to change anything by dressing the emperor up in new clothes? By tarting old thinking up through new terms and modern analyses? After all those twentieth century catastrophes?

Or then another example, of a somewhat pubertal American position. Inverting Hardt & Negri, as it were, Jaron Zepele Lanier criticizes the Internet's entropic phenomena: "cybernetic totalism,"⁶² "digital Maoism,"⁶³ and "You are not a gadget."⁶⁴ Demands creativity, independencies, autonomies. His way out: post-symbolic communication.⁶⁵ E.g. the famous cephalopodan camouflages.⁶⁶ Fantasizes about a new, expanded world in which communication happens intuitively, with images, with our bodies. "For instance, instead of saying, 'I'm hungry; let's go crab hunting', you might simulate your own transparency so your friends could see your empty stomach, or you might turn into a video game about crab hunting so you and your compatriots could get in a little practice before the actual hunt. I call this post-symbolic communication." Whence this absurd notion, of thoughts being visible? In the past they used to measure skulls. Today they put on helmets. As though thoughts were lying about somewhere. Amazing, this perceiving the intuitive—i.e. the basic concept of modern times, foundation of the development of every machine, but not that of the computer—as the solution for "cybernetic totalism." This back-coupling is "cybernetic totalism." Pure intuitivity leads to entropy, as we know. The way out is "potentiability," the ability of dealing with potentialities, technically realized in computers. Lanier, prime protagonist of "virtual reality," dreams of a new man whose potentiability is mechanical. Dreams of a Terminator capable of surviving all destructions and reconfiguring himself without

62 Jaron Lanier, "One Half a Manifesto," *Edge*, November 11, 2000, http://www.edge.org/3rd_culture/lanier/lanier_index.html.

63 Jaron Lanier, "Digital Maoism: The Hazards of the New Online Collectivism," *Edge*, May 30, 2006, http://www.edge.org/3rd_culture/laniero6/laniero6_index.html.

64 Jaron Lanier, *You Are Not a Gadget: A Manifesto* (New York: Alfred A. Knopf, 2010).

65 Jaron Lanier, "How Octopi Morph Color," *Discover*, April 2, 2006, <http://discovermagazine.com/2006/apr/cephalopod-morphing/>.

66 Cf. "Octopus wow," video clip, January 15, 2009, <http://www.youtube.com/watch?v=8CLKyMFHSfg>.

end.⁶⁷ Bodiless, intellect-less. Pure mechanistics. Disregards, in his mechanistic camouflage-analyses, the existence of things like facial and gestural expressions, dance, and more. That were with us forever. As cultural, not natural phenomena. Whence then this delusion of having to recreate, on the cultural basis of our usual ways of thinking, our technologies, a new man systematically oblivious of what we culturally are? Whence this frenzy of naturalizing ourselves within some second, technically animated nature? Whence this disinclination from all things “impure,” i.e. at once natural and cultural? In the case of Marx just as in that of Hardt & Negri, or here Lanier’s ...

Or take the object-oriented ontologies of one Levi Bryant who runs a philosophy blog with some notable 2.5 million visitors.⁶⁸ Intent upon pulling philosophy out of its “anthropocentric” isolation. Demanding a new “Copernican Revolution.” A backward somersault. Out of man, into the world. For regaining the ability of talking to natural scientists, and engineers. Charging Kant with anthropocentrism. Him of all people, who so handsomely contributed to rendering that Renaissance concept of man calculable through dissecting and meting of thoughts, and vaporizing it. Thus enabling Hegel to orchestrate power structures from populations of humans and things. In every respect. There is no more natural center. Neither sun, nor man. For two hundred years. Only potentials that are being gathered. Vectors that are rationally established. Toward urbanity, nation-states, universities, industries. For a long time now, man has ceased to be the center. And it goes on: the notion of object-oriented programming originated in the 1960s with the intent of simulating physical connections through information technology.⁶⁹ Today this notion is largely established. Neither the virtual environments of the game worlds nor the graphical user interfaces of the operating systems are conceivable without this paradigm. And here now comes Levi’s real Copernican Revolution: at a central place, he quotes Heidegger’s *Being and Time*: “For manifestly you have long been aware of what you mean when you use the expression ‘being’. We, however, who used to think we understood it, have now become perplexed.” Following it up by: “This epigraph could just as easily be rephrased substituting the word ‘object’ for ‘being.’” Amazing, this turning Heidegger so ruthlessly on his head. This insouciantly jumbling Heidegger’s two central concepts of “ontics” and “ontology” into one and then simply carrying on with ontics in ontology’s guise.



κ [FIG. 42] P. 72



κ [FIG. 43] P. 72



κ [FIG. 44] P. 72



κ [FIG. 45] P. 72

67 The T-1000 in *Terminator 2: Judgement Day*, directed by James Cameron (TriStar Pictures, 1991).

68 Levi Bryant, “Onticology—A Manifesto for Object-Oriented Ontology, Part 1,” *Larval Subjects* (blog), January 12, 2010, <http://larvalsubjects.wordpress.com/2010/01/12/object-oriented-ontology-a-manifesto-part-i/>.

69 Ole-Johan Dahl and Kristen Nygaard, “Simula—An ALGOL-Based Simulation Language,” *Communications of the ACM* 9, no. 9 (1966): 671–78.

This replacing the “being” by some technical contraption, and instrumentalizing Heidegger so as to gain acceptance as a philosopher for oneself and be loved by the sciences. Daring. Amazing, not least perhaps because one sits, as a humanities scholar, nonplussed before the monitor and marvels at those things learning to walk. *Matrix*.⁷⁰ *Sims*.⁷¹ “Mythicizing technical objects as ‘larval subjects,’” or so he calls his blog. A heart for machines. Love-me tech. Bryant, as a philosopher, is now demanding the Copernican Revolution, a Renaissance, for these larval subjects. Emancipating them from man, as man has emancipated himself from the sun. A total subjugation of man under the mechanical. Strangelove. Or: how I learned to love the machine. The last one out to tidy up Earth. Wall-E.⁷²

As we can see, emancipating from today’s naturalizations of the information technologies is far from easy. In my case, abstracting from the reductions of one Stiny, and learning to appreciate the richness of eighty-years-earlier discourses around Hilbert. But perhaps the particular characterization of the twentieth century lies precisely with this ignorance about its roots, which makes possible the breathtaking secularizations of this time: in 1900, there were 100,000 scientists worldwide. Today there are 100,000,000. In 1950, 1,000 million people were able to read and write. Today 6,000 million are. In 1900, life expectancy in the developed countries was forty-seven years; today it is sixty-seven worldwide. What does one do when in such a very short time-span so many more people at once can read and have so much more time? Perhaps it might be as well in such an instance to go easy about new concepts. Perhaps the mechanistic thinking of the technologies will perforce begin to stabilize, because there aren’t enough different and differentiated models for such growth. So the technical infrastructures are transmuting into an animated second nature. Into the abstract breeding ground that is acceptable worldwide without anyone actually feeling concerned by alien cultures one wouldn’t be able straightaway to integrate. Hence the infantile, the drastic, the stereotypes. Abstractions that make globalization bearable, possible, without need of becoming machine-like themselves.

Or Wikipedia: how are these availabilities to be enabled without mediocre authors agreeing about a common denominator? Might it be that on the one hand we need something Wikipedia-like as a humus, while on the other hand we define ourselves per our difference from Wikipedia? Is there another way? Infrastructures, logistics, sediments, intellectual breeding ground. And was the encyclopedias and their eminent authors’ situation any different?

⁷⁰ *The Matrix*, directed by Andy and Larry Wachowski (Warner, 1999).

⁷¹ *The Sims*, computer game, director Will Wright (Maxis: Electronic Arts, 2000).

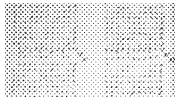
⁷² *WALL-E*, directed by Andrew Stanton (Pixar, 2008).

We shall pursue this train of thought. On the one hand, there are today's institutional infrastructures, the dependabilities, availabilities, reassurances, stabilities, *references* of the second nature. We are used to them, in the form of technical infrastructures, cables, pylons, pumps, pipes, tanks, machines, sensors, displays, actuators. And we know them as standardized global media-izations, embedded in the schemata of formats like news, photography, telephony, music, cinematography, teaching programs, cleaning programs, foodstuffs, control systems, research programs, production schemes, politics, jurisdiction ... in all those things on which we can depend. With this, we described technology as deceleration. On the other hand, there are things that are open, that unexpectedly burst into being, that surprise. That we may bring about through humor, through know-how, through affection, through concentration. Things that never were. Things that always were, and unsuspectedly appear in a new light. Quite an affair, indeed. Possible anywhere, anytime. Possibly now. Beauty, fascination, love, elegance. Out of the blue. The *immanence* of the possibility of its happening, upon removing an infinitesimal scrap, upon adding a tiny nuance, by just stirring, touching, briefly halting the mere time of one breath. Perhaps. These immanences throw open the reference system, give birth to new things. Create references, sometime. Things around us are referenced, secured, on the one hand. While on the other hand being indexed, open for any new reference. Our second nature gets animated and alive within the secured schemata, and it is up to us to be spirited, since we live within that nature.

Somewhat astonishing perhaps, such terms, in this context. But look up your indices, particularly those of the nineteenth century. Much speaks for this being a real affair.

Let us pick up from the discussions about Dedekind, his cut, and the notion of continuity, and turn to Markov.⁷⁵ His chain of infinite, isolated—now we may say, unspirited—points without meaning. Pure determinability. In 1913, Andrej Andreyevich Markov, the mathematician, grabbed the first 20,000 characters of *Eugene Onegin*, Aleksander Pushkin's novel in verse, and mechanically counted off the alternations of vocals and consonants. Just think of that! Simply counts off the characters of this famous Russian poem. Mechanically puts these numbers in relation to one another. Pulls up a probabilistic structure ... and manages, with just one small fragment, mechanically to find the proper text passage. No need to analyze a text completely, to know it thoroughly in order to synthesize the next step. No need

75 Andrej A. Markov, *Berechenbare Künste: Mathematik, Poesie, Moderne*, ed. by Philipp von Hilgers (Zurich: Diaphanes, 2007).



κ [Fig. 46] P. 73



κ [Fig. 47] P. 73

for a precise notion of a text in order to find one's way around in it. According to Markov, the spirit of the text is not within the letters. The spirit is not within the references. It resides in the immanences. And with his schematic indexing system, he demonstrates for the first time that it is possible to operate with immanences. We need a fragment, an idea—and a system made of indices begins to gleam. Abstraction from analysis and synthesis. That's Markov. Fabulous.

And meanwhile it has grown humdrum. Any blurred technical picture,⁷⁴ any noise-beset telephone call ... we do recognize the person, recall the mood, hear the intonation. It does not take many fragments of our analytical reference systems for the situations to become rich. A challenge to any supposedly intuitive immediacy, to analytical care, scientific method, enthusiasts of analogous hi-fi recordings, even to statistics. All relegated to the corner of trivial functionality. Flushed out. Analytics cannot succeed in what Markov can. Not through care, not through orderliness, not through hygiene. Nor through real or metaphorical psycho-technology or bio-technology. Those are all but complications of the trivial.

Let us think of an example up to demonstrating the confusion that Markov ought to create. An example from medicine: certain diseases are diagnosable through their symptoms. That's how the Middle Ages diagnosed and treated. Others are predictable through statistics. That's how they are identified since the modern age, and fought statistically through hygiene, or checked through vaccination. And then there are diseases that defy statistical methods, that are unpredictable, and therefore beyond hygiene and checking. Yet they are there. As, e.g., cancer. Markov ought to be able to find them, because he abstains from trying to understand Pushkin's poem, renounces trying to describe cancer, and for this very reason is up to predicting it. That may be putting it a bit imprecisely. More adequately one would speak in terms such as coexistence with cancer, as a thing essentially in-nominable. One would be living with cancer in order to avoid it.

Fantastic? Not really. For it is indeed the way Google works. Google meets the fragment of our search term with an orderly list of useful documents. No analysis, no understanding on Google's part. Just near-infinite lists, indices, and probabilities. We, as users, are, in our coexistence with that medium, setting the ties, the frequencies, the probabilities. Google, just as Markov, doesn't care a jot about why or how. And yet, the system is fantastic: not in our wildest dreams might we have imagined anything so multifarious. Adaptable, fast, stimulating ... movement within the others' movement ... intellectual propellant ...

74 Vilém Flusser, *Für eine Philosophie der Fotografie* (Göttingen: European Photography, 1983); as well as *Ins Universum der technischen Bilder* (Göttingen: European Photography, 1990).

intentionalities ... liberating for being ungraspable. No machine. No hygiene. No multitude. Rather “potentitude.”

Therefore we had better examine, along with the so frequently misinterpreted Deleuze, the conditionalities for the faculties of reason which are at work within the differences.⁷⁵ In contrast to Deleuze, however, we are to reflect upon ways we might grow familiar with such a notion of reason. How to “household” such wealth. How to economize those riches, which Deleuze still naturalizes as abilities.

Adventurous? Not quite! For more than one hundred years Boole, Dedekind, Peirce, Wittgenstein, Turing, Gödel, Markov, and today Foucault, Deleuze, and Guattari, are playing within this orthogonality. Today, on the new stage of intentional quantities, one may—to extend the metaphor of the running, channeled, and retained water—let the water come. Because we don’t have to hold it this way or that, but are able, on the new orthogonal stage, to hold it any which way. Because computers are no machines, or rather, speaking with Michel Serres,⁷⁶ no apparatus, but abstract apparatus. We are no longer being talked to via channel systems, by some nature, some machine, some bureaucracy, some technocracy, but we place those, as algebraic bodies, orthogonally on stage, and let them simply do their talking. Now the general apparatus, the processors are talking, are able to decelerate applicatively, analytically, vividly that which is being attributed to them. We combine them on scene, appreciatively. This is what we are going to call “articulating.” In this interplay—electro-magnetic, quantum-mechanical ...—we “pump” water, energies, current, data, telephone calls ..., and they are all no longer elusive, but concentrating, narrating, joking, having affairs ... if we appreciate them.

A simple diagram of an inverted channel system may help document that: the quantum-mechanical effects of a solar tree, through a cable, are conducting electro-magnetic effects—current—into the sea. There—back in what we can more intuitively grasp—a pump presses water through a membrane for desalination, which is then piped back to the solar tree. Thus the one solar tree generates enough water for twenty natural trees. Simply because we were able to articulate it and appreciate, e.g. in the desert, having water for trees. Nothing in this staging is being used up, and very little is used. The scenario is pure intellect. If we attempted to put this in a more concrete mode of speaking, however, something were continuously to be held up, channeled, consumed. In a world that corresponds more with our intuitive expectations, water doesn’t arrive just like that. In the mode of



κ [FIG. 48] P. 73



κ [FIG. 49] P. 73



κ [FIG. 50] P. 73

75 Gilles Deleuze, *Differenz und Wiederholung*, trans. Joseph Vogl (Munich: Fink, 1992), esp. chapter 4. Original: Gilles Deleuze, *Différence et répétition* (Paris: Presses universitaires de France, 1968).

76 Michel Serres, *La distribution*, *Hermès*, vol. 4 (Paris: Les Éditions de Minuit, 1977). German edition: *Verteilung*, *Hermes IV* (Berlin: Merve, 1995).

intuitive expectation, things always run out. Whereas a purely intellectual scenario is abstract, whence we may relax. In grading, assessing talk we inspect the many intuitively talking things—from the outside. There are plenty of them. We can hear them talk. They are all intent upon withholding. We should no longer be taking analyses seriously, but populations of analyses. Nor models, but that which is model-like in kind. Nor generalizations, but abstractions. Not any more the functions, causes, signs. By linguistically dealing with the symbols of code, we are in a position of creating stabilities on the level of symmetries, and invariances. Trusting in symbolic algebra in lieu of arithmetics and analytical geometry. In articulations instead of linear, structural, or post-structural constructs or historical accounts. We may become operational within universal richness. Machine or no machine? Machines rebel against testing in *Blade Runner*, a 1982 film.