

Research Article

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Conviviality, the Internet, and AI. Ivan Illich, Bernard Stiegler, and the Question Concerning Information-technological Self-limitation

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Abstract: In his book *Tools for Conviviality* (1975), Ivan Illich calls for human self-limitation in technology development. His aim is neither environmental protection nor the prevention of unforeseen side-effects of technology development, but the comprehensibility of technologies' operating principles for the user. For if the construction or repairing of tools requires expert knowledge inaccessible to the public, this necessarily entails social imbalances in power. In a similar manner, Bernard Stiegler conceives the delegation of know-how to technological systems as a kind of proletarianization that ultimately may result in a loss of *savoir-vivre*. Without sweepingly rejecting the division of labour, automation or specialized knowledge, practices of commoning respond to such diagnoses: free software like GNU/Linux or open hardware largely succeed in unlinking the expert knowledge that advanced computing doubtlessly requires from problematic power effects. From this perspective, proprietary algorithms are problematic, as their lack of transparency prevents conviviality. This also holds for the practices of data aggregation and extraction which steadily increase the information gap between platform providers and users. An even more fundamental problem is posed by so-called "self-learning", i.e., recursively adapting, algorithms: it is not clear how and to what extent the knowledge and instructions generated by "artificial intelligence" can be traced and reconstructed by human insight. Thus, we are confronted with a situation of potentially non-recoverable proletarianization and non-conviviality that exposes a renewed urgency of Illich's considerations concerning technological self-limitation.

Keywords: Ivan Illich, Bernard Stiegler, artificial intelligence, proletarianization, algorithmic transparency

1 Introduction

In his book *Tools for Conviviality* (1975), Ivan Illich calls for human self-limitation in technology development. His aim is neither environmental protection nor the prevention of unforeseen side-effects of technology development, but the comprehensibility of technologies' operating principles for the user. For if the construction or repairing of tools requires expert knowledge inaccessible to the public, this necessarily entails social imbalances in power. In a similar manner, Bernard Stiegler, in his critique of political economy, conceives the delegation of know-how to technological systems as a kind of proletarianization that ultimately may result in a loss of *savoir-vivre*.

Without sweepingly rejecting the division of labour, automation or specialized knowledge, practices of commoning provide a way of responding to such diagnoses: free software like GNU/Linux or open hardware largely succeeds in unlinking the expert knowledge that advanced computing doubtlessly requires from problematic power effects (cf. Benkler). From this perspective, proprietary algorithms are problematic, as their lack of transparency prevents conviviality. This also holds for the practices of data aggregation and extraction which steadily increase the information gap between platform providers and users.

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An even more fundamental problem is posed by so-called “self-learning”, i.e., recursively adapting, algorithms: it is not clear how and to what extent the knowledge and instructions generated by “artificial intelligence” can be traced and reconstructed by human insight. Thus, we are confronted with a situation of potentially non-recoverable proletarianization and non-conviviality that exposes a renewed urgency of Illich’s considerations concerning technological self-limitation.

In order to demonstrate this urgency, I will first sketch different ways of technological self-limitation that can be considered to be relevant for conviviality. Then I will turn to Ivan Illich’s thesis that conviviality is enabled and fostered by tools that have a specific structure. This structure implies restraints on technologies’ complexities. To further enhance the plausibility to this idea, I complement it with Bernard Stiegler’s thinking of generalized proletarianization. I will argue that convivial societies can be described as *associated milieus* in Stiegler’s understanding (cf. 37), such that the kind of self-limitation discussed here can be understood as a strategy for preventing proletarianization. In the final part, I will apply these considerations to the societal impact of opaque algorithms.

2 Conviviality and technological self-limitation

When self-limitation is discussed in the context of conviviality, it usually refers to the limits of economic growth. The *Convivialist Manifesto* for instance, published in 2014, challenges the “aspiration to never-ending material growth” (26) by pointing to “[g]lobal warming and the disasters [...] it will trigger.” (21) The manifesto questions the belief that growth could provide “a lasting solution to human conflict” (27): it is plausible that material growth “sparks off as many conflicts as it resolves, if not more”; and furthermore – whether intrinsically desirable or not – unrestricted economic growth is not an option in view of “the now undeniable finiteness of the planet and its natural resources” (27). However, limiting economic growth is not the only kind of self-limitation that is relevant in the context of conviviality. If we turn to Ivan Illich, whose thought had considerable impact on contemporary conceptions of conviviality, we find a demand not only for limits to material growth but also beyond that, to certain kinds of technological progress.

Among other reasons, this is important, since technological progress is frequently expected to tackle global warming: among others, efficiency gains, the increased use of renewable energy sources, and even the highly controversial interventions of geo-engineering are presented as approaches for solving this problem. Jeremy Rifkin (2012) expected a “third industrial revolution” where the production of both goods and energy is decentralized and democratized, to usher an ecologically sustainable era. However, the expectations that cognitive capitalism is cleaner and greener than industrial capitalism might be misleading, since the energy footprint of information and communication technologies is currently growing by 9% each year. By now the share of digital technologies in global greenhouse gas emissions is 3.7%, while civil air transport had a share around 2% in 2018 (cf. The Shift Project).

One should keep in mind that convivialism does not only comprise ecologic and economical, but also moral and political dimensions. Thus, rapid changes to forms of sociality, knowledge, and labor induced by networked computer technology are highly relevant to convivialist thought even beyond ecological concerns, since circular or iterative relationships between social practice and infrastructure can be observed: infrastructures are both a sedimented result of established social habits and they contribute to forming new ones. Consequently, the commons are as much result of practices of commoning, as they enable and shape these practices. Computer- and network-based communication and information technologies have always been a major domain of commoning. Information – due to its low-cost reproducibility – does not display the scarcity that characterizes material goods. And networks seem to provide an alternative organizational model that entails more balanced power relations than traditional top-down structures. As they thus appear to enable “a world-wide civic society”, the *Convivialist Manifesto* portrays “digital networks – of which the Internet is a key example, but not the only one – as a powerful tool for democratizing society and for generating solutions that neither the market nor the state has managed to come up with” (33). While the manifesto calls for treating those networks as commons and thus for “a policy of openness, free access, impartiality, and sharing” (33), the actual developments of the internet seem to have taken a different path. Although common resources are flourishing on the web, the vast majority of services offered on the internet are provided by opaque, proprietary algorithms like the ones operating in Facebook’s and Google’s recommendation systems. To an increasing extent, so-called artificial intelligence is involved in the making of decisions that have huge effects on society – for example, risk calculations in politics and

in the financial sector as well as credit and insurance contracts, and so-called “predictive policing”. Here, to a large extent the knowledge and instructions generated cannot even be traced and reconstructed anymore by the developers and owners of the software. In view of such developments that prove utterly incompatible with practices of conviviality, a different kind of self-limitation becomes vital: a convivialist lifestyle is only possible by restraining from the kinds of technological “progress” that entail such incompatibilities. It was Ivan Illich who, already in 1973, addressed such a kind of incompatibility.

3 Illich’s call for self-limitation in technology development

One of Illich’s key claims is that two watersheds can be observed that technologies and techno-scientific domains pass as they progress: a first one, where advances lead to a significant improvement of people’s quality of life, and a second one, where the development tips and gets perverted, as excessive institutionalization and professional monopolization of knowledge turn out to be disadvantageous for society.

Aside from education and transport, Illich discusses the case of medicine. Medicine, he states, passed the first watershed in the beginning of the twentieth century, when the probability of successful medical treatment was exceeding 50% for the first time. Illich attributes high effectivity to a number of “simple habits” (19), like a balanced diet or calisthenics, and simple “tools” (19) like toothbrushes, band-aids and condoms that became widely available at that time. (Precisely such devices turn out to be paradigmatic examples of what Illich calls *tools for conviviality*, cf. the next section.) However, ultimately those positive effects were foiled when medicine passed its second watershed in the course of advancing institutionalization and monopolization of medical knowledge.

Illich points out that comparing positive and negative effects of medical progress is difficult. The quantitative parameters which are employed for justifying the narrative of progress are highly selective, and they obviously do not bring into account negative effects like “illusion, social control, prolonged suffering, loneliness, genetic deteriorations, and frustration produced by medical treatment” (20).

For the case of medicine, Illich dates the two watersheds to 1913 and 1955. Yet he claims that, within a similar time frame, numerous other domains are affected by similar developments. Schools, for example, could no longer claim to be effective tools to provide education and cars ceased to be effective tools for mass transportation. In the case of transport, the benefits of motorized vehicles transformed into “virtual enslavement to the car” (20). Desirable mobility was gradually reduced to, and, ultimately, identified with, higher speed of cars. When transportation passed through its second watershed, traffic came to consume additional time instead of saving time.

Illich describes the *generic structure of the two watersheds* as follows: “At first, new knowledge is applied to the solution of a clearly stated problem and scientific measuring sticks are applied to account for the new efficiency. But at a second point, the progress demonstrated in a previous achievement is used as a rationale for the exploitation of society as a whole in the service of a value which is determined and constantly revised by an element of society, by one of its self-certifying professional elites.” (20) One can thus speak of a perversion of means into ends here. On Illich’s account, the problems that arise from this intensify, as one paradoxically attempts to tackle them with even more technological means (and, i.e., with even stronger institutionalization and monopolization of expert knowledge): with “further technological and bureaucratic escalation” (21).

In spite of all reservation he expresses against quantitative measures of success, in particularly against those of increase in production or turnover, it is striking that the development Illich portrays seems to suppose a certain kind of quantitative correlation with the degree of mechanization, institutionalization and progress: if this degree transgresses a certain threshold, negative effects dominate. It is therefore that the quantitatively oriented concept of *self-limitation* (which even features as the title for the German translation of *Tools for Conviviality*) can provide a strategy for solving the described problems. One should notice here that Illich calls for self-limitation not only with regard to the production and turnover of industrial products, but also – and this is essential for my argument in this paper – with regard to the *degree of technological complexity*, which otherwise inevitably leads to a surpassing of the second watershed. However, at first sight the claim of such a correlation seems to conflict with Illich’s thesis that the decisive factor is not the technological level of tools (cf. 36), but rather their *depth structure*. In accordance with this hypothesis, Illich tries

to provide means for an analysis of tools and focuses on their structure. The next section of the present paper will take up his discussion of specific tools in order to clarify how Illich's favoured tool structure meshes with the call for technological self-limitation.

4 Tools for conviviality

Illich's *concept of a tool* is a fairly broad one that comprises both concrete artefacts and institutional arrangements (along with the sets of rules they define). Tools are deemed relevant by Illich because, as mentioned in the previous section, their structure entails certain practices and dispositions of the humans who use them.¹ With regard to social practice, Illich's analysis is based on the *opposition of convivial society and industrial society*. He asks which tools correspond to and promote a certain kind of society. This leads him to a distinction between *tools for conviviality* and *industrial tools*. I will thus proceed by first exploring Illich's concept of conviviality and then reconstruct his criteria for conviviality-promoting tools.

Illich defines as *convivial* a society "in which modern technologies serve politically interrelated individuals rather than managers" (12). Such a convivial society is precisely one of "responsibly limited tools" (12). Illich situates his understanding of conviviality in proximity to the ancient Greek *eutrapelia*, one of Aristotle's virtues which can be translated as dexterity, wit or esprit. In line with his idea of self-limitation, Illich links *eutrapelia* to austerity. However, following Thomas Aquinas, he argues that this does not imply to "exclude all enjoyments, but only those which are distracting from or destructive of personal relatedness" (13). Understood in this way, austerity is motivated by the "apprehension that things or tools could destroy rather than enhance *eutrapelia* (or graceful playfulness) in personal relations" (13). Illich's consideration thus aims at a certain kind of agility or playfulness and asks, whether and by which tools it could be fostered.²

What people need is not primarily supply with things: "they need above all the freedom to make things among which they can live, or give shape to them according to their own tastes, and to put them to use in caring for and about others." (24) Precisely this demand is not satisfied by industrial production.

This entails a particular kind of impotence that Illich illustrates with the example of prisoners: "Prisoners in rich countries often have access to more things and services than members of their families, but they have no say in how things are to be made and cannot decide what to do with them. Their punishment consists of being deprived of what I shall call 'conviviality'. They are degraded to the status of mere consumers." (24) Illich argues that supply with industrial products cannot compensate the restraint of convivial freedom that results from such a situation. In this specific sense the notion of conviviality means "the opposite of industrial productivity" (24): It refers to "autonomous and creative intercourse among persons, and the intercourse of persons with their environment; and this in contrast with the conditioned response of persons to the demands made upon them by others, and by a man-made environment." (24) In short, conviviality is "individual freedom realized in personal interdependence" and Illich deems it to be, "as such, an intrinsic ethical value" (24).

A society is convivial, if people have the opportunity to shape the things they – jointly – have to deal with, in mutual interdependency and relatedness both to each other and to nature. This definition has implications for the politics of technology: Precisely because technologies, beyond their instrumental capacities, have significant impact on human practices and social relations, their design is of political relevance and needs to be democratized. Otherwise, if a technological elite monopolizes the designing of tools, this elite obtains the capacity to impose certain practices and power

¹ Thus, one should not conclude prematurely that Illich falls prey to what, following Heidegger (1977), could be called an *instrumental* conception of technology (cf. 5). As will become clear in the next section, Illich acknowledges the reciprocal impact that society and technology have on each other and addresses one specific aspect of technologies' non-instrumentality related to power imbalances. It would go beyond the scope of the present paper, which focuses on exploring this aspect, to discuss in detail the theoretical shortcomings Illich's approach doubtlessly has, e.g. lacking media-theoretical reflexivity or an unquestioned anthropological/ontological focus on production and work.

² Observe that this entails a different perspective on tools from one that simply focuses on their instrumental capacities to serve this or that purpose. Depending on *how* they serve their purpose, they also have social implications.

relations on society. Since tools are “intrinsic to social relationships” (34), *con-vivere*, living together, implies the *capacity to shape interpersonal relationships by shaping the artefacts and institutions that matter in those relationships*. Thus, in a first approximation, we can observe that tools for conviviality are characterized by their *individual and collective shapeability*.³ This entails the demand for “procedures to ensure that controls over the tools of society are established and governed by political process rather than by decisions by experts” (25).

What would political measures that safeguard a convivial society look like? This is where self-limitation enters the picture: According to Illich, it would be necessary to prohibit “the design of artifacts and rules that are obstacles to the exercise of this personal freedom. Such politics would limit the scope of tools as demanded by the protection of three values: survival, justice, and self-defined work.” (26) Illich deems these three values to be fundamental to any convivial society, and each value “imposes its own limit on tools” (26). This concern with limitations for tools is relevant with regard to contemporary debates about conviviality and commons, as it implies the *need for political regulation*. According to Illich, bottom-up convivial practice, be it consumption or the do-it-yourself production of artefacts, is not sufficient for bringing about a convivial society.

This leads us to the *explicit criteria* for convivial tools Illich mentions in this context. His declared aspiration is a methodology that enables diagnosing the perversion of means into ends: “My purpose is to lay down criteria by which the manipulation of people for the sake of their tools can be immediately recognized, and thus to exclude those artifacts and institutions which inevitably extinguish a convivial life style.” (27-8) His analysis *emphasizes the tools themselves and not the intentions of the users*; it is about the structure of tools and not the personality structure of those who use them. This is because of the consideration that tools enable a particular practice in the first place and thus also contribute to shaping a certain disposition or mentality. (Already in Aristotle’s classical assessment, it is repeated praxis which forms a certain disposition.) Accordingly, industrialization inevitably leads to a “homogenization of personalities and personal relationships” (28), while a “pluralism of limited tools and of convivial commonweals would of necessity encourage a diversity of life styles” (29).

According to Illich, there is an industrial deformation of our imaginative capacities that prevents us from envisioning anything that cannot be “moulded into an engineered system or social habits that fit the logic of large-scale production” (28). We have difficulties to “conceive of higher social effectiveness with lower industrial efficiency” (33). Yet, Illich suspects that the division of sciences, of labour, and of professions – note that this division is precisely a mark of techno-scientific progress beyond mere economic growth – could have gone too far (cf. 33). “As the power of machines increases,” he claims, “the role of persons more and more decreases to that of mere consumers.” (23) In this sense, there is a direct connection between the accomplished degree of technological progress and the turning of positive effects into negative ones. “[R]egimentation, dependence, exploitation, and impotence” proliferate when tools grow beyond a certain point (33-4). From this, Illich derives the need for “limits to specialization and output” (33).

However, Illich’s acknowledgement of the reciprocal constitution of the human and the technological sphere sometimes seems to get suspended, resulting in an analysis that boils down to a rather simplistic master-slave-dialectics that is all about an unilateral relation of domination or control: Either the user actively masters the tools he/she uses, or he/she is dominated by them: “To the degree that he masters his tools, he can invest the world with his meaning; to the degree that he is mastered by his tools the shape of the tool determines his own selfimage.” (34) Here, freedom seems to be conceived of as freedom *from* technology, as if there ever existed an autonomous and pre-technological human subject – an assumption that would contradict Illich’s own insight into the mutual impact the human and technology exert upon each other. Yet, taking into account that humans are not autonomous *homines fabri* in control of technology, since they are inevitably shaped by it as much as they shape it, does not render Illich’s quest for democratizing technology design obsolete: In the iterative, reciprocal constitution of humans and their technological condition, it makes a huge difference if human input in this feedback cycle is restricted to a small elite or possible for everyone who wishes to contribute in it. On the basis of this distinction it still makes sense to define convivial tools as “those which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision” (34). In

³ Even in the post-anthropocentric vocabulary of Actor-Network-Theory, which forms a very different theoretical tradition, both the “extent to which the composition of a technical object constrains actants in the way they relate both to the object and to one another” and the extent to which actants “are able to reshape the object, and the various ways in which the object may be used” (Akrich 206), have been proposed as central evaluative criteria for the *de-scription* of technological objects.

societies dominated by industrialism, one scarcely finds such tools according to Illich. “Industrial tools deny this possibility to those who use them and they allow their designers to determine the meaning and expectations of others.” (34) More specifically, Illich provides specific criteria for evaluating whether a tool can be used in a convivial fashion (cf. 35):

1. can everyone use it? (e.g. is a library only accessible for the members of an educational institution?)
2. can the tool be used as often or as seldom as desired? (this also entails the question whether there is an imposition to use it or not)
3. can the user determine the purpose of the accomplishment for which it is used? (does it enable the user to realize his/her ideas?)

Industrial tools are *manipulatory*, since they “create the specific demands they are specialized to satisfy” in the first place (37), and they are *abstract*, since they are produced “for men in general” (37). Convivial tools, in contrast, foster self-realization and enable people to “pursue their own goals in their unique way” (37).

An implication of this analysis both for Marxist theory and for contemporary debates about the commons is that the decisive question does not concern the ownership of means of production: “The issue at hand is not the juridical ownership of tools, but rather the discovery of the characteristic of some tools which make it impossible for anybody to ‘own’ them. The concept of ownership cannot be applied to a tool that cannot be controlled.” (39) This is not meant to say that the question of ownership is irrelevant; but conversely it implies that *public ownership of means of production is not a sufficient solution* of the problem addressed by Illich. In section 8 of this paper, artificial intelligence (AI) will be described precisely as such a technology that might be impossible to own. If this is the case, following Illich, AI would have to be excluded by self-limitation. Before developing this argument, I will complement Illich’s account with Bernard Stiegler’s considerations concerning generalized proletarianization.⁴ Invoking Stiegler will help to rephrase the issue at stake in a more dependable fashion, since (1) he acknowledges the human’s fundamentally technological condition more clearly and coherently than Illich and (2) he emphasizes technology’s irreducible ambivalence against any supposed linearity of technological evolution.

5 Stiegler on commerce and proletarianization

In Illich, conviviality refers to free, creative and playful intercourse both between persons and between persons and their environment. In a similar manner, Bernard Stiegler refers to *commerce* as a kind of exchange that goes beyond the commensurability of the market: as the French word, referring “to conversation and more generally to all forms of fruitful social relation,” indicates, commerce is “always an exchange of *savoir-faire* (knowledge of how to make or do) and *savoir-vivre* (knowledge of how to live)” (16).⁵ And, just like Illich claims that such intercourse is made possible by the capacity to shape the tools that are intrinsic to social relationships, Stiegler also deems such a capacity to be an essential condition for commerce. Stiegler calls an environment of infrastructures and things that is shapeable by those who inhabit it an *associated milieu*.⁶ Both in Illich and Stiegler, work is a central domain where this shaping of the environment takes place.⁷ “In the milieu of associated work, the workers, through their work, fashion an experience in which they cause their milieu to evolve – their tools, for example, or the way in which they are used, not to mention, of course, the products of their use. They open up [*ouvrent*] this milieu of which they are the workers [*ouvriers*].” (37-8) The participation of the workers in shaping their environment ensures the *openness* of this environment. However, such

⁴ Stiegler’s oeuvre is vast and even to cover the aspects that are immediately relevant for the discussion at hand would be beyond the scope of the present paper. I will therefore restrain myself to his “For a New Critique of Political Economy”, which provides a rather condensed and concise account of the issues at stake. Furthermore, this text departs from a discussion of the notion of *commerce* that shares significant commonalities with Illich’s understanding of conviviality.

⁵ Also in the convivialist manifesto, exchange plays a central role. There, however, the point of reference is Marcel Mauss’ conception of exchange, which is irreducible to market exchange as well (cf. Frank Adloff’s introduction to the *Convivialist Manifesto* (9-12).

⁶ Stiegler appropriates this concept from Gilbert Simondon, whose thought significantly influenced his own.

⁷ Neither Illich nor Stiegler go as far as questioning the notion and the value of work itself. Illich claims that “[p]eople need new tools to work with rather than tools that ‘work’ for them” (23). Stiegler interprets *otium* as a *kind of work* that *differs* from labour/*negotium* (cf. 53-4).

participation of people in the shaping of their environment is threatened by “industrialization and mechanization”, which create new forms of exchange in a *consumerist* market that presupposes “the liquidation of both *savoir-faire* and *savoir-vivre*” (16).

This threat can be understood as a *delegation* of human capacities to technologies. *Exteriorization*, according to Stiegler, is “the root of the technical question”.⁸ The idea of such delegation or exteriorization has a long tradition in occidental thought; it dates back at least to the critique of alphabetic writing articulated in Plato’s *Phaedrus*. There, it is argued that the external, written memory (*hypomnesis*) actually does not enhance the internal, living memory of humans (*anamnesis*) but rather tends to destroy it: people do not need to remember things for themselves anymore, as they can rely on written notes. They can just take over what has been written by others without needing to reconstruct those claims and to verify their validity themselves. Thus, by relying on external sources, people lose the capacity of authentic knowledge.

Jacques Derrida, Stiegler’s teacher, deconstructs the opposition of anamnesis and hypomnesis. And while Stiegler agrees with Derrida that it is impossible to oppose the living memory to the external memory since the first is constituted by the second, he yet also maintains that Plato was right and that there actually *is* a threat of a loss of capacities, once they are delegated to technology. This becomes particularly evident in Marx’s thinking of proletarianization, where – according to Stiegler – the “truth of Plato” is to be found: “the Platonic question of hypomnesis constitutes the first version of a thinking of proletarianization, insofar as it is true that the proletariat are those economic actors who are without knowledge because they are without memory: their memory has passed into the machine that reproduces gestures that the proletariat no longer needs to know – they must simply serve the reproductive machine and thus, once again, they become serfs.” (35)

Stiegler interprets the history of media and technologies as a process of *grammatization*, that is, a progressing discretization of the “flows and continuities which weave our existences” (31): First, the flows of speech were discretized in alphabetic writing. With the industrial revolution, the process of grammatization surpassed the realm of language in order to discretize the gestures of the body of the producer and thus to enable automatic production. Simultaneously, the “machines and apparatuses for reproducing the visible and the audible” – prominently discussed by Walter Benjamin – grammatized “perception and, through that, the affective activity of the nervous system” (33). Now, with the development of electronic and digital devices, *all* kinds of knowledge can become grammatized. In this stage, grammatization does not only concern the *savoir-faire*, but it “will also include *savoir-vivre*, that is, behavior in general, from user profiling to the grammatization of affects – all of which will lead toward the ‘cognitive’ and ‘cultural’ capitalism of the hyperindustrial *service* economies” (33). Hence the destruction of all kinds of knowledge mentioned above, from theoretical and practical knowledge to the art of living itself. Its exteriorization makes knowledge susceptible for “sociopolitical and biopolitical controls” (34). Stiegler’s critique of the power imbalances brought about by exteriorization dovetails well with Illich’s call for a convivial society that is “designed to allow all its members the most autonomous action by means of tools least controlled by others.” (Illich 33)

While, for Illich, technological progress straightforwardly leads to the power imbalances entailed by the second watershed, in Stiegler, the progress of grammatization does not necessarily imply advanced proletarianization. Grammatization is ambivalent, or, in Stiegler’s terms, *pharmacological*. (In ancient Greek, *pharmakon* meant both a poison and a cure.) The relevant question here is whether grammatization leads to associated milieus which, following Illich’s terminology could also be called convivial, or to disassociated milieus. Associated milieus are ones that allow for “transindividuation, through which, by becoming individuated through work, that is, through learning something, the worker individuates the milieu of their work” (38). In disassociated milieus, in contrast, the processes of transindividuation are *short-circuited*. Here, proletarianization “excludes this participation of the producer from the evolution of the conditions of production” (38). Stiegler’s associated milieus can thus be mapped to milieus of convivial tools, which grant their users the opportunity “to enrich the environment with the fruits of his or her vision” in Illich (34). Disassociated milieus, in contrast, can be understood as environments of industrial tools which deny this possibility to their users

⁸ Stiegler understands the technical question in Marx’s terms as the “production of self by self in which the human consists” (30). Thus, again, we encounter the reciprocal constitution of technology and human practice that is so central both to Illich and to the thinking of *coming*.

and allow their designers “to determine the meaning and expectations of others” (34). In this sense, Illich and Stiegler share the same concern: whether people are able to shape the environment of artefacts and infrastructures that enable their working- and living-together. In the next section I will discuss, how, following Illich and Stiegler, our contemporary media-technological environment is to be assessed with regard to its potential for conviviality and commerce.

6 Media technologies as tools for conviviality?

When analyzing tools for conviviality, Illich frequently also discusses media technologies. For example, he portrays the book as a combination of two “almost ideally convivial” technologies, namely the alphabet and the printing press (78). “Almost anybody can learn to use them, and for their own purpose. They use cheap materials. People can take them or leave them as they wish. They are not easily controlled by third parties.” (78-9) Alphabetic writing and the printing press imply a *de-professionalization of the written word*. This tendency is supported by several media: “With the alphabet the merchant broke the monopoly of the priest over hieroglyphs. With cheap paper and pencil, and later with the typewriter and modern copying devices, a set of new techniques had in principle opened the era of nonprofessional, truly convivial, communication by record. The tape recorder and camera added new media to fully interactive communication.” (79) However, the empowering effects that result from this have repeatedly been intercepted by institutionalization, says Illich who, in this point, seems close to Hans Magnus Enzensberger’s assessment of the emancipatory potential of media technologies in his “Constituents of a Theory of Media”: “these ideally convivial tools” have been put “at the service of more one-way teaching.” (79)

In this vein, libraries get appropriated by schooling: “As the library got ‘better,’ the book was further withdrawn from the handy bookshelf. The reference librarian placed himself between people and shelves; now he is being replaced by the computer.” (79) Still, if it is properly used, the library is the “prototype of a convivial tool” (79). It could serve as the role model for other learning devices in order to enhance access to tapes, pictures and records.

Illich proposes that investment into learning should not be guided by predetermined goals for learning outcomes. Rather, people should simply be asked what kinds of tools they need for learning and the demanded means should be provided. When the “idea that people would learn more from random access to learning resources than they can be taught” is questioned with reference to “the declining use of libraries”, Illich objects “that libraries are little used because they have been organized as formidable teaching devices. Libraries are not used because people have been trained to demand that they be taught.” (80) This resonates nicely with a comment former Google CEO Eric Schmitt made and which is revealing about the direction the development of the internet takes recently: “I actually think most people don’t want Google to answer their questions. They want Google to tell them what they should be doing next.” (quoted in Farrar) In this sense, Google is one of the most extreme instances of the kind of authority that Illich perceives as being placed “between user and shelves”.

Yet basically the internet can be seen as an environment providing the kind of learning devices that, precisely as Illich demands, are not appropriated by schooling. In fact, it is primarily the *centralized production of content* that Illich opposes in the context of media. For example, he criticizes that “a few professional journalists got vast readerships, while the majority was reduced to token representation in the ‘Letters to the Editor’ section.” (78). Illich perceives the practice that “provide[s] millions of viewers with the colour image of one performer” as the epitome of industrialism, while a convivial approach would strive to “provide many people with free access to the records of their choice.” (48) The concern with decentralization becomes particularly obvious when Illich discusses the telephone as an example of a tool that is convivial in its structure: “The telephone lets anybody say what he wants to the person of his choice; he can conduct business, express love, or pick a quarrel. It is impossible for bureaucrats to define what people say to each other on the phone, even though they can interfere with - or protect - the privacy of their exchange.” (35) Something similar could be said about contemporary exchange on the internet. On the basis of such statements, we may speculate whether Illich would have liked Web 2.0. One could suggest that services such as Youtube realize the free access to records that he demands. The so-called social media seem to extend the convivial structure of the telephone – with the mentioned ambivalences regarding the status of privacy. Can the Internet be said to realize the demands of a convivial society?

While, in the case of Illich, we can only extrapolate his assessments about past media environments into the present, Stiegler provides us with a differentiated analysis of the media-technological situation today. He claims that with the network economy “a genuine mutation of grammatization” has occurred: “digital reticulation, whereby cognitive activities are themselves proletarianized, constitutes a rupture through which associated milieus are formed, that is, milieus of individuation running counter to the processes of dissociation and disindividuation in which proletarianization consists” (48). Hence the ambivalence, i.e., the pharmacological character of today’s media-technological environment is a particularly pronounced one: “the digital pharmakon, which makes possible the proletarianization of the nervous system, is also what introduces the possibility of a new regime of psychic and collective individuation and, with it, the possibility of a new process of transindividuation opening onto an unprecedented politico-economic perspective” (48). A new kind of economy becomes possible, namely an *economy of contribution* in a collaborative and dialogical milieu (cf. 48).

Although Stiegler claims that this economy “nullifies the producer/consumer opposition” (50), his position should not be subsumed too easily to the shallow and outdated praise of the democratic, anti-hierarchical and decentralized qualities of the internet. He clarifies that the contributors to this economy are those who contribute to the creation of “long circuits of transindividuation” (50).⁹ The milieu of digital networks is very well “capable of implementing logics of dissociation” (50) – so that it can only provide an alternative on the basis of “a veritable revolution of the dominant industrial model – which may fall short of an *overthrow* [*renversement*] of capitalism, but which would certainly be a *revolution* of capitalism.” (49) Thus the economy of contribution is not as such necessarily entailed by the emergence of digital networks. Rather it has to be achieved in a political and therapeutic struggle.

One can ask whether today’s digital networks are not precisely the domain where “demands” are “made by tools on people”, and where various (hyper)nudges¹⁰ are “fitting man to the service” of these tools – just the way Illich criticizes it about industrial tools (60). Shoshana Zuboff has suggested that the services of companies like Google or Facebook should not be understood as tools for the users, but rather as “means of behavioural modification” (82) offered to paying customers. Search requests, communication on “social networks” and location based services are only some of the sources that are employed to aggregate the vast amounts of data that fuel what Zuboff terms “surveillance capitalism” (75). More and more socially relevant decisions are made on algorithm-based processing of such data, and the people who are affected by these decisions hardly ever have the possibility of participating in the algorithm design. Thus, digital networks, as they are predominantly organized today, can hardly be said to form an associated or convivial milieu. We have to question premature portrayals of the digital milieu as a contrast foil to industrialism. Already in 1973, Illich described the “age of electronic cybernetics” as “a hyper-industrial age” (48), and Stiegler classifies cognitive capitalism as “hyperindustrial” (33) as well.¹¹ The critical question is whether and how algorithms can be subjected to public political negotiation – a question that becomes even more pressing in the case of recursively adapting “artificial intelligence” algorithms.

7 Algorithms and opacity

Frank Pasquale describes contemporary society as a *black box society*, thereby invoking the twofold metaphor of the black box: on the one hand, it refers to a system that is opaque in its workings. We may observe which input leads to which output, but the inner logic of information processing remains inaccessible to us. On the other hand, it refers to the data-recording units in planes, trains, or cars. This twofold metaphor is meant to express that, while our behaviour is, to an increasing extent, object of surveillance and data extraction, the ways algorithmic decisions are made on the basis of this data remain opaque for us. “To scrutinize others while avoiding scrutiny oneself,” Pasquale claims, “is one

⁹ It is beyond the scope of this paper to discuss how Stiegler’s critique of political economy also involves a libidinal economy where individuation depends on the accumulation of libidinal energy through the positing of incommensurable objects of desire.

¹⁰ Cf. Thaler/Sunstein for the concept of “nudge” and Yeung for its expansion to data-based and algorithmically customized “hypernudge”.

¹¹ Therefore, the shapeability of tools that features as a critical criterion for conviviality in Illich must not be confused with the *customization* or *personalization* of tools. A tool that has been personalized on the basis of personal data is something very different from a tool that grants the user the possibility to *participate actively and unrestrictedly in its design*.

of the most important forms of power” (3). Thus, companies like Facebook and Google form exactly the kind of expert elite that, according to Illich, emerges when people cannot participate in the shaping of their tools.¹²

Authority is increasingly expressed algorithmically. Socially relevant decisions do not result from human reflection anymore, but from automated data processing. Their opacity protects the algorithms from being scrutinized publicly. Internet companies use data about us to make decisions about us, or to influence the decisions that we make for ourselves. They direct our attention “toward some ideas, goods, and services, and away from others” (6). By doing so, they organize the world for us. “Recommendation engines at Amazon and You-Tube affect an automated familiarity, gently suggesting offerings they think we’ll like. But don’t discount the significance of that ‘perhaps.’ The economic, political, and cultural agendas behind their suggestions are hard to unravel.” (5) For example, by describing the assessment of the relevance of a website as a purely technical problem, data scientists hide the values that guide this assessment in a black box.

Pasquale describes several strategies that are used to achieve algorithmic opacity. *Real secrecy* is obtained by ensuring by technical means that no one can access an algorithm’s source code. *Legal secrecy* uses legal constructions to prohibit that relevant information is delivered, for example in the case of proprietary software. However, as activists press for transparency, there is a third strategy to prevent that a system is scrutinized: namely, *obfuscation* by raising its complexity to such a level that it is “as effective at defeating understanding as real or legal secrecy” (8).

As we have seen above, the increase in technologies’ complexity, the lack of intelligibility, and hence the power imbalances it entails, was Illich’s main concern when demanding self-limitation with regard to the level of technological development. However, Illich is aware that it is difficult to separate intentionally over-complex design from mere technological progress: The “barring of alternatives” entailed by a technology’s design, he states, “has usually coincided with the increased power of the tool and the development of more complex tool systems.” (36) Still, Illich deems the fact that “simple pliers and screwdrivers are insufficient to repair modern cars” (36) to be a limitation *on purpose*. If cars thus would be subject to convivial regulation, their complexity would have to be limited to such a level that prevents such an “institutional monopoly” on repairing cars (36). (This becomes even more evident today, as cars get colonized by advanced digital technology.) Pasquale makes a similar proposal of technological self-limitation: If a system is so complicated that it is not intelligible to outsiders but does not provide “substantial gains in efficiency” (according to Pasquale this is the case e.g. in financial transactions), “regulators should step in and limit complexity” (8).

Observe that by adding the phrase “without substantial gains in efficiency”, Pasquale provides an important qualification here in comparison to Illich. Illich sometimes seems to be willing to sacrifice any kind of technical convenience, if it comes at the price of preventing the conviviality of the technology. For instance, he considers that the speed of transportation might be limited to the maximum speed of a bicycle for the sake of “equal distribution on a worldwide scale”, even though he concedes that it would be “mere fantasy to assume an egalitarian consensus sufficiently strong to accept such a proposal” (97).¹³

Yet, when it comes to algorithmic data processing, the practices of commoning provide an alternative to self-limitation. Even though the majority of people might not be able to code software, free and open source software make it possible that communities are formed where non-experts still can participate in the negotiation of the shape a program takes, although they might not be able to contribute source code themselves (cf. Benkler, specifically 59 on free software as commons; 321-3 on its potential in the context of development; and 436-7 on its structural resistance to the imposition of constraints on software functionality).

¹² Ananny and Crawford (2016) have challenged the demand for algorithmic transparency by claiming that “it is sometimes unnecessary and always insufficient to simply look inside structures” (13). Yet their paper actually does not provide any examples where this transparency would really be unnecessary and elsewhere they concede that “[i]t may be necessary to access code to hold a system accountable” (9). Although transparency of code is in fact a *necessary* condition of algorithmic accountability, the authors are nevertheless right to point out that it is not a *sufficient* one. As the present paper strives to demonstrate, algorithmic transparency is an essential precondition for achieving an associated digital milieu where a convivial lifestyle is possible.

¹³ Yet Illich also makes clear that he actually does not advocate the abandonment of any kind of industrial technology: “It would equally be a mistake to demand that for the sake of conviviality the distribution of industrial goods and services be reduced to the minimum consistent with survival in order to protect the maximum equal right to self-determined participation. Different balances between distributive justice and participatory justice can prevail in societies equally striving for postindustrial conviviality, depending on the history, political ideals, and physical resources of a community.” (37)

In the final part of this paper, however, I would like to focus on one specific kind of increase in the complexity of software that seems to entail severe obstacles to subjecting it to public scrutiny, namely algorithms derived from machine-learning.

8 Conviviality and AI?

The fact that their progress tends to withdraw technologies from public scrutiny is also confirmed by Bruno Latour: “When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become.” (304)

When it comes to artificial intelligence or machine learning, Jenna Burell suggests differentiating between different kinds of opacity. To the problem of proprietary protection or corporate secrecy she adds two further aspects of opacity. One concerns code literacy. Since only a small part of the population is able to read and write code, many people are excluded from understanding the workings of the algorithm. To counter this problem, Burell suggests to “educate a broader swathe of society in code writing and computational skills to lessen the problem of a homogenous and elite class of technical people making consequential decisions that cannot be easily assessed by non-members.” (10) However, from the perspective advocated here, I would not consider the code literacy problem to be a central one, since it only applies in situations where the algorithms code is in fact accessible. As mentioned in the previous section, the commoning practices around free and open source software provide ways for maintaining convivial participation even though coding still remains expert knowledge. Furthermore, educational efforts to enable people to be responsible participants of algorithmically permeated societies cannot be reduced to coding skills. Instead, a broader approach would be helpful here, which also comprises relevant knowledge from the humanities and social sciences as well as acquaintance with the arts. Programming know-how alone will hardly suffice to ensure genuine *savoir-vivre*.

However, a further and distinct kind of opacity emerges in the case of machine learning algorithms: “When a computer learns and consequently builds its own representation of a classification decision, it does so without regard for human comprehension. Machine optimizations based on training data do not naturally accord with human semantic explanations.” (10) This results in an incongruence between human understanding and the machine’s classifications that is called the *interpretability problem* in computer science (cf. Burrell 9; Sudmann 189).

While there are increasing research efforts to solve this problem and make AI accountable, the thesis persists that deep learning algorithms might be a black box that cannot be opened. Andreas Sudmann has revised several strategies researchers employ to understand and reverse-engineer artificial neuronal networks, among them the Local Interpretable Model-Agnostic Explanations program (LIME), Deep Dream and the pointing and justification model (PJ-X). LIME tries to examine what effects variations in input have on the output of a network. By setting up a huge number of variational tests, it strives to single out the decisive factors that determine which input is accepted by the network. Sudmann qualifies LIME as a mere “experimental system” so that it would be an “exaggeration to claim that this model indeed provides an explanation in any profound sense” (189). Deep Dream is transforming images in such a way that they would become accepted by an image recognition algorithm, thereby producing “images that have a surreal and grotesque quality” (190). PJ-X, again operating on images, tries “to correlate images that show objects or human activities not only with their description (by labelling them), but also with their respective explanation” (190). According to Sudmann, all three models are “still far away from being able to explain its own internal operations or those of different machine (or of another ANN [Artificial Neural Network], if you will)” (190). Thus, so far, “the label ‘Explainable AI’ is misleading or perhaps at least an exaggeration” (191). Sudmann also discusses the politics of OpenAI, in its self-description a non-profit research company co-founded by Sam Altman and Elon Musk. Sudmann’s assessment is that OpenAI’s central claim of democratizing AI is actually not maintainable: There is nothing specifically ‘open’ about the company’s agenda – “Facebook, Microsoft, and many other IT companies basically have the same agenda” (193): All those big players are mainly interested in the improvement of existing technology and in the acceleration of AI research.

We do not know how future research may develop and whether methods for making the findings of machine learning algorithms intelligible for human reason and thus accessible for public scrutiny and political negotiation. However,

as long as this is not the case – if we follow the arguments of Illich and Stiegler extracted in this paper – a convivial society should restrain from employing machine learning algorithms for any socially relevant decisions.¹⁴

Works Cited

- Akrich, Madeleine. "The De-Description of Technical Objects." *Shaping Technology/ Building Society. Studies in Sociotechnical Change*, edited by Wiebe E. Bijker and John Law, MIT Press, 1992, pp. 205–224.
- Ananny, Mike and Kate Crawford (2016): "Seeing without knowing: Limitations of the transparency ideal and its application to algorithmic accountability." *new media & society*, 2016, pp. 1-17, <https://doi.org/10.1177/1461444816676645>.
- Benkler, Yochai. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, 2006.
- Burell, Jenna. "How the Machine 'Thinks': Understanding Opacity in Machine Learning algorithms." *Big Data & Society*, vol. 3, no. January-June, 2016, pp. 1–12.
- Convivialist Manifesto. *A Declaration of Interdependence (Global Dialogues 3)*. Käte Hamburger Kolleg / Centre for Global Cooperation Research (KHK/GCR21), 2014, <https://doi.org/10.14282/2198-0403-GD-3>.
- Farrar, James. "Google to End Serendipity (by Creating It)." *ZDNet*, 17 Aug. 2010, www.zdnet.com/article/google-to-end-serendipity-by-creating-it/. Accessed 26 June 2020.
- Heidegger, Martin. *The Question Concerning Technology and Other Essays* (W. Lovitt, Trans.). Harper & Row, 1977.
- Illich, Ivan. *Tools for Conviviality*. Harper & Row, 1973.
- Latour, Bruno. *Pandora's Hope. Essays on the Reality of Science Studies*. Harvard University Press, 1999.
- Pasquale, Frank. *The Black Box Society. The Secret Algorithms That Control Money and Information*. Harvard University Press, 2015. <https://doi.org/10.4159/harvard.9780674736061>.
- Rifkin, Jeremy. "The Third Industrial Revolution: How the Internet, Green Electricity, and 3-D Printing are Ushering in a Sustainable Era of Distributed Capitalism", *The World Financial Review*, March-April 2012, pp. 8-12, <http://www.siaf.ch/files/130410-rifkin-1.pdf>
- The Shift Project. *Lean ICT – Towards Digital Sobriety*. https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report_The-Shift-Project_2019.pdf
- Stiegler, Bernard. "For a New Critique of Political Economy." *Polity*, 2010.
- Sudmann, Andreas. "On the Media-Political Dimension of Artificial Intelligence. Deep Learning as a Black Box and OpenAI." *Digital Culture & Society*, vol. 4, no. 1, 2018, pp. 181–200.
- Thaler, Richard H., and Cass R. Sunstein. *Nudge. Improving Decisions About Health, Wealth, and Happiness*. Yale University Press, 2008.
- Yeung, Karen. "'Hypernudge': Big Data as a mode of regulation by design." *Information Communication and Society*, vol. 20, no. 1, 2017, pp. 118–36.
- Zuboff, Shoshana. "Big other: Surveillance Capitalism and the Prospects of an Information Civilization." *Journal of Information Technology*, vol. 30, no. 1, 2015, pp. 75–89.

14 While this may appear to be a rather radical conclusion, it is also one that is drawn by, among others, developers of software for self-driving cars: "One social scientist doing field work among researchers developing a self-driving car found that these researchers avoid using machine learning entirely because 'you don't know what it learns.' The innumerable situations not represented in the training set lead to unpredictable and possibly potentially life-threatening consequences." (Burell 11)