Imagining and Inventing Bespoke Devices for Experimental Sound Practices

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This paper looks at the case of do-it-yourself (DIY) musical instruments, and how the somewhat common practice–in certain fields of experimental music at least–of developing bespoke sound devices can present itself as a problem case in light of the role of free activity and the crafting/discovering of prosthetic mediators, as presented by Gilbert Simondon in his book *Imagination and Invention*.

1. Feedback between different regimes

In a 1965-1966 series of lectures for the Institute of Psychology at the Sorbonne University, philosopher Gilbert Simondon presented the course *Imagination et Invention*, later compiled as a book in French, and translated in 2022 to English as *Imagination and Invention* (IMIN) by Joe Hughes and Christophe Wall-Romana. In these lectures, Simondon set out to present and formalise a theory of what he would name the "genesis of images" (5), where he elaborates on a mode of world-being comprised of phases of "anticipation, experience, and systematization" (19) which leads to, and creates the conditions for, the main topic and concern of his course: the act of invention as it relates to mental images. Not so much concerned with how individuals come into being i.e., matters of individuation and ontogenesis, central to his previous work up until that point, in IMIN his energy is directed at how the *transformation of a system* takes place as it is surveyed, experienced, inhabited–until ultimately saturated–by individuals.

Invention is set-up by Simondon, preliminarily, as a consequence of a need for problem solving, an "interruption due to an obstacle" (139). Some ongoing process is brought to a halt demanding thus a reconfiguration of the environment, along with one's interaction with it, in order to permit the process to continue. A rolling boulder blocking a narrow path is suggested; too heavy for the single traveler, but possible to be moved by the collective effort of several travelers. At that point, we can understand that invention is suggested to be predicated on (at least some level of) a formed image of a future goal. This is central, as the dialectics between a current material reality and a subsequent projected state of things will become an operational framework through which Simondon will develop his propositions. The blocking boulder itself fosters the *image* of the beyond-boulder.

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A path to an envisioned result, when faced with a discontinuity imposed by a barrier, sets up a dynamic of feedback between what Simondon understands as two "regimes", or "orders of magnitude": that of the "reality of the result", and that of the "means and subsets within a mode of compatibility" (166), in other words, an interplay between what could be considered the material *reality* of a present moment, and a projected ideal *potentiality* of an envisioned goal. Invention then appears as an emergent property of the communication between those two regimes, a result of the back-and-forth movement along modalities of coupling between organism and milieu, while pursuing a possible barrier-removing solution. Anthropologist Tim Ingold, in his book *Being Alive - Essays on Movement, Knowledge and Description* (2021), will comment on a similar existing feedback loop between ideal images and the material realities which may foster their subsequent realisation, in what he calls "Karl Marx's dilemma":

> [...] the human labour process, said Marx, "ends in the creation of something which, when the process began, already existed [...] in an ideal form" (Marx [1867]1930, 170). Yet for Marx, this model of creation presented something of a dilemma. *For if the form of a thing must already exist in the imagination before the work of production can even begin, where does this initial image come from?* (5, emphasis added)

Once more, a movement between two Simondonian "regimes" is presented, now with special emphasis placed on their co-relation and mutual influence insofar as *production* is concerned: is a crafted object a form of ideal thought that becomes materialised? Conversely, can mental images spawn from *finalised* material objects turned into symbolic representation? In particular, Ingold's concern is one of the relationships, and close circuit, between the regimes of "*consumption* and production, the one converting pre-existing images into final objects, the other converting objects into images" (5). He sets out to emphasize how, problematically to Marx' materialist proposition, "Marx had to pull objects from a hat in order to set the ball rolling" and "to ask which comes first, production or consumption, is to pose a chicken and egg question" (5). In a more general sense though, and more fitting to the purpose of this paper, what is being put forth is a problematisation of *ex nihilo* creation. Ingold's proposition of a close circuit between emergent images and produced objects seems to advocate against a pure from-idea-to-product creation process, where an uninterrupted, unimpeded downstream –which springs from free imagination– would flow in

the direction of a "thing". Finally, if invention is to be understood as triggered by the confrontation of certain organisms with "a discontinuity acting as a barrier to an operative implementation [*accomplissement opératoire*]" (Simondon [1965-66]2022, 139), Simondon and Ingold will then meet while advocating for an understanding that ideas find their origin in some form of perceptual-motor interaction, which is grounded in physical/lived experience.

2. On instrumental action

Simondon will follow with a proposition that this feedback, this "transfer system between two different orders of magnitude" (140) by which invention happens, can be enacted not only on a first-order-basis relationship between organism and milieu, but also by means of what he calls "adaptation systems" (142). It can rely on external instruments which will mediate the process, in the literal sense of the word: objects might be placed *in the middle* and "link" those two regimes.

Philosopher Carlo Sini, when developing an argument on the role of instrumental work in social and intellectual processes of scientific knowledge production, will speak in terms of an "exosomatic extension", e.g., a tree branch used as stick which "prolongs and thus *enhances* the action of the arm" (Sini 2021, 84, emphasis added). Insofar as instrumental action plays a role in one's process of probing an environment, Sini argues that:

> [...] precisely the inertia of the instrument, its structural limitation with respect to the world, the fact that the world-environment is also much other than "stick-able", points to the infinite improvability of the instrument and the invention of further tools. (84-85)

In this, may we call it, *prosthetic view* on our interaction with technology, i.e., external objects being drafted as enhancers of the body, the "use of the stick teaches the agent about the 'objective' inertia of [a] world [...] endowed with characteristics independent of human agents" (Sini 2021, 84). There is a recognition of the "thickness of things" [*espessura das coisas*] (Padovani 2013, 168), the "thing-y-ness" of things (Baird 2004, 145). Such is the case for Simondon, which will also bring the imagery of the instrumentalised tree branch. He will argue though, that it is only after a first stage where the agent "spontaneously manipulates" the instrument in order to probe its "operative properties", a stage in which problem solving is not the main goal, that the image of an improved stick,

and consequently its fabrication, can be “recruited at the moment of difficulty” (Simondon [1965-66]2022, 148).

It is important though to limit the scope of both propositions, in terms of their applicability. While I subscribe to Sini’s premise that technology, as exosomatic augmentation, is able to act as gauge to an agent’s range of possibilities when navigating an environment, I object to his conclusion, as it fails to break free of a utilitarian, problem solving paradigm. The same, to a lesser extent, can be said of Simondon.

When Sini states that by encountering and experiencing the structural limitations of the stick-turned-instrument it is revealed to us that not everything in the world is “stick-able”, which in turn sets in motion an “infinite improvability of the instrument” via a “progressive complication” (85), what he suggests is simply the crafting of a better stick. Even using a stick, my target is far; therefore, one should improve on it by attaching two branches together in order to reach said target. What that doesn’t account for, is a process of world-sensing where one learns the environment is indeed not stick-able, but it might be brush-able, bow-able, caress-able, left-alone-able. Or that the branch might also serve as fan, writing utensil, or juggling pin. There is still a process of negotiation with the material affordances of the mediator, enacted through a motor-perceptual interaction. In Simondonian terms, we are still operating in a regime where a phase-alignment between organism and milieu does take place. Only now, new operations and interactions with the world are revealed through this newly crafted augmented prosthesis–“If I poke a hole in the branch and spin it really fast, it sounds really cool!”–which don’t have problem solving as both starting trigger, and end goal. There is no clear boulder to be removed here, at least not at first. Technology is interrogated, materials are transformed, and objects are crafted; not purely as resource, but as ways of investigating, discovering, and producing knowledge about possible modes of existence in the world. So, a movement to Simondon’s second “order of magnitude”, one where goal-oriented behaviour plays a role, can happen. But it isn’t the driving force of the process.

If we look at those mediators as *technical-epistemic prosthesis* which will extend and enhance the field of possible world-actions, as well as our conception of the environment around us, the stage is set then for invention to be approached and inquired as a *technologically-mediated* activity, one which will concern itself, to a great extent, with managing the transit between those two regimes.

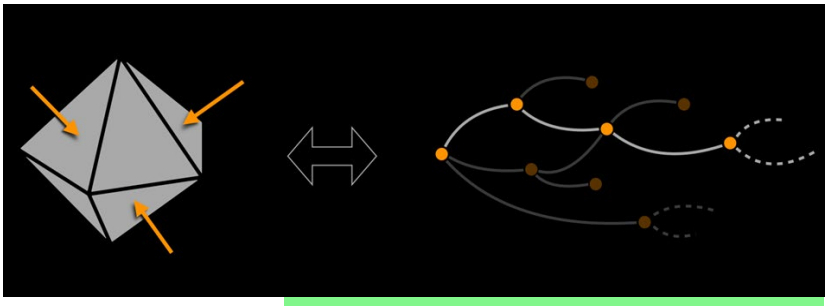

Fig. 1. Two orders of magnitude

3. Tree-traversing

In my practice as experimental music composer / sound artist, and activities as artistic researcher, one of the things I'm interested in is how creative decisions are made precisely when transiting between those regimes, and the role of technology in informing those creative decisions. More specifically, I investigate the consequences of having bespoke instrument building and technology tinkering as the main driving motor of my composition process.

Figure 1 illustrates the described condition: on the left, an object is engaged with by means of free exploration, in a search for *entry points*, i.e., certain characteristics and/or modes of operation of the technology where poietic potentiality is perceived. This process of data gathering while looking *inward* at an object, exists, in tandem, as the root node of a sprawling tree of possible actions; one which moves *outwards* towards a clearer image of what both the composition and its accompanying instrument are, arriving eventually at what I will denominate a *device-work pair*.

3.1. The problem of concurrency

One problem to consider here could be put as one of *concurrency* between the two regimes. The logical circularity between, in Simondon's terms, different orders of magnitude: that of the design of an instrument, and that of the crystallisation of the identity of a composition. A possible paraphrase of Ingold's Marx's dilemma, in this context, could be then "[...] for if the design of a musical instrument being fabricated relies on the role it will play in an imagined musical work which hasn't been yet composed, where does the initial design of the instrument come from?". And because it is a circular causality, the complementary reversed phrasing is also valid: "[...] for if the image of a musical work being composed requires a custom musical instrument which hasn't been conceived yet, where does the initial image of the composition come from?"

On this problem of concurrency, manifested in Figure 1 as a lack of representation of a time domain, one might have the impression that a clear path, a "complete mental image" (Simondon [1965-66]2022,

148) of the intended goal, is present from the start. But that is not the case. There is no clear rolling boulder to be removed here. When I'm investigating a new object (for example, a so-called "obsolete" electronic device acquired at a flea market) the alternation between the two regimes has a much quicker turnaround time, i.e., the frequency of what Simondon will call the "temporary substitution of the instrument-object for the end-object" (143), is much higher, to the extent that calling it "temporary" might not even apply. A more accurate visualisation of the sprawling tree analogy would start with a root node, a single seed if you will, and nothing more. As I engage in "spontaneous manipulat[ion] [...] before any finalized behavior" (148), *events* will occur which will disturb that aimless manipulation. Certain behaviours may stand out for their sonic and gestural potency, or technical properties of the device might draw my attention simply for their pure technicity and my curiosity in learning how they work. Those events then start to add *differences* in what, before, was highly *undifferentiated*. The space of possibilities starts to gain a possible topography, steering my movement into preferred possible directions. So, a discontinuity, yes, but of a different kind. Not one which blocks movement, but one that will trigger me to create/imagine new nodes and their connecting edges. In that sense, my territory is not being organised or structured. It is the *territory itself that is being invented* by a process of inquiring the material affordances of a certain technical device, a process which in turns modulates my own "population of mental images" when I'm deciding what will be my next creative step - even if the end goal is not in sight.

3.2. Revealing borders

Mediation has consequences in two distinct areas, namely the creation process of a work, as well as the work's final form. For the work itself, one can think in terms of an enforced "technographical imprint" [*marca tecnográfica*] (Caesar 2009). A symbolic groove that a technical object leaves on an art object by simply being part of its creation process.

Examples range from early acousmatic music, where the length of loops were a direct consequence of the physical size of shellac disks available at the time, to the non-metric quality of most network performed music, as broadcasting latency makes it difficult for synchronicity between performers. Those are characteristics that are not present in the works as a reflection of the artist's will, but quite the opposite - they're imposed by the devices mediating the creative process. From this observation, I propose an understanding of this condition in terms of a negotiation established between apparatus and

artist along (and through) this mediation, where the artist, by speculating creatively with a device, is presented with the terms with which that device accepts to operate. The creative act is molded, adapted, redefined, according to the discovery of the affordances (Magnusson 2019) present in the apparatus one speculates with. One could conclude then that technology, when mediating art making, reveals its limits, its borders.

3.3. Intuitive relations

One aspect of experimental lutherie which presents itself as an interesting edge case for Simondon's theory, concerns a mode of world-sensing which is not derived of a "perceptual-motor reality", but instead, is built on a relationship to technology which composer and scholar Jonathan Impett will call "intuitive". DIY practices of instrument building often leverage competences from fields such as computer science, by programming and implementing custom software, and different branches of engineering, with the creation and modification of electronic circuits for example. While some artists are indeed professionally trained programmers and/or engineers, many aren't. That implies that inquiring a piece of technology for its artistic potentiality has, embedded in the act, the meta-process of learning what that technology itself is and how it operates. That interaction happens through free activity, where things are manipulated in their material regimes, certainly; but also there is a great deal of "interaction with the *idea* of a thing", where our relationship to technology is based on "partial, reconstructed knowledge rather than direct experience" (Impett 2020). Impett will state that "not only can this idea be wrong, it is crucial to cultural evolution that it is *free* to be wrong, misconstrued, reconstrued", since there lies its novelty, plasticity, and therefore its potency.

4. Conclusion – Inhabiting a border

Simondon recognizes that "perceptual investigation" exists, i.e., one that forgoes direct engagement, although he seems to see it as a problem, since it precludes "adequate discernment of [the mediators] complex operative properties". He will propose that humans have a "constant necessity to confront the partial novelty of situations with an activity of organization of operative modes" (150). What I call attention to then, is a mode of art making which is built on the basis of a *conscious, intentional attitude* of seeking the partial novelty afforded by engaging with technological apparatus: from learning a new programming language, to disassembling a still unknown device. There is a will to inhabit a place which offers resistance and to actively

engage with those borders, since that friction, which comes from material direct engagement with technology, is what will drive the creative act. The border is there, but to be interacted with. Not as a shackle. As succinctly put by experimental music pioneer Alvin Lucier, “no ideas but in things”.

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