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Worldviews for Design Theory

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1. The Problem of Disintegration, and the Suspicion of Insidious Inconsistency

Institutionalized design research has been undertaken for forty years or more, and for those of us involved it has generated a research community, complete with pioneers, 'founding fathers', and leading figures, learned societies, formal journals and conferences, and a continuous informal debate. Even though different schools of thought can be distinguished it seems uncontroversial to speak straightforwardly of 'design research' or 'the design research community' presupposing unity and coherence. For they are *social* constructs, and what keeps them together is the fascination of design that we share despite any disagreements on the subject.

But apart from its social functions, the societal function of the design research community is to do design research, the outcome of which in turn is a growing body of *design theory*. By this I do not mean theory about how to design, about how designers think or work, or about what design is; but all of this and much more: quite broadly theory that expresses scholarly knowledge and understanding of whatever is called 'design'. But can we also speak straightforwardly of 'design theory' (the entire 'body' thus defined), presupposing unity and coherence? I'm afraid not. For a *theory*, as I use the term, [1] is a *logical* construct, a system of propositions. What would generate 'unity and coherence' is *consistency*. But in the face of disagreements on theoretical tenets within the design research community – and such disagreements there are – the 'body' of design *theory* threatens to disintegrate into mutually inconsistent design *theories* (each of which may be self-consistent; indeed must be, to express anything meaningful).

In a keynote address to the design research community, professor Buchanan (2004) contended that 'One of the strengths of our field is that we hold different views' (p 1). For example, we have no consensus about the definition of 'design', but 'have come to recognize that battles over the correct definition of design are fruitless'; instead we should 'understand that definitions serve the purpose of shaping a particular line of

[1] Suitable dictionary definitions: 'the analysis of a set of facts in their relation to one another' (Merriam_Webster_Online_Dictionary); or 'a formal statement of ideas which are suggested to explain a fact or event' (Cambridge_Advanced_Leaner's_Dictionary).

inquiry and that the field will be vital as long as definitions come and go […]' (p 15). Nor is there any 'dominant philosophy of design' but rather 'a remarkable pluralism of views' (p 16). And further: 'the differences, when they are intelligently expressed and discussed, are an ongoing source of new insight. Pluralism is the gene pool that ensures the sustainability of design inquiry.'

In the social context of the design research community he was right: different views stimulate good discussions, hence good thinking, and ultimately good research. Yet it is in the interest of the very same research community – and of community at large – that disintegration of design *theory* into rivalling design *theories* does not get out of hand. As researchers we have an obligation to produce theory that is generally credible and widely sharable outside our own circles; but the more such disintegration we allow, the less credible and sharable our products become. So how do we keep the plurality and the ensuing disintegration of our emerging 'body' of design theory within reasonable bounds, without jeopardizing the freedom of design research? That is the question I will (begin to) address. (The *Problem of Disintegration*, for later reference.)

Differences already acknowledged and 'intelligently expressed and discussed', are relatively harmless. If we state our definitions and other initial assumptions as *conditions* under which our theoretical results are asserted (rather than asserting them unconditionally), then at least in a formal sense, much inconsistency can be avoided; though not, of course, the underlying disagreement.

Much more treacherous are the non- and pre-empirical *metaphysical* assumptions we make about the ultimate nature of reality, often tacitly and unknowingly, because we tend to take them for granted. There could be no theory about design or any other aspect of reality without some understanding of reality in general. Hence there can be no theory without endorsement – tacit or explicit, inadvertent or deliberate – of tenets of metaphysics. Metaphysics is what provides us, as Wartofsky (1979) puts it, with 'the most general and abstract account of the *conditions* under which anything whatever comes to be understood' (p 70, emphasis added).

When I call our metaphysical assumptions *treacherous*, it is because we cannot help making them, any more than we can help eating. But just as food may cause infectious diseases if contaminated so, I submit, our metaphysical assumptions may be incoherent[2] without our knowing, and thus cause undetected inconsistency in our 'body' of theory. (The *Suspicion of Insidious Inconsistency*, for reference.) Such 'insidious inconsistency' in our theories does not reflect genuine disagreement on their subject matter (design). Therefore, it should not be tolerated.

My suspicion calls for justification. However, 'screening' existing theories for the 'disease' of insidious inconsistency would be an onerous task. Although the method described in (Love, 2000) might be applied to it (see 2.3 below), I shall justify my suspicion merely by presenting a few artificial but, I think, persuasive and scalable, 'toy examples' (section 3). Suffice it for now to note and acknowledge that the basic idea of 'insidious inconsistency' is not new. Peirce (1931) wrote:

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[2] I.e., allow a contradiction to be inferred.

'Find a scientific[3] man who proposes to get along without any metaphysics […] and you have found one whose doctrines are thoroughly vitiated by the crude and uncriticized metaphysics with which they are packed.' If I am right about the Suspicion of Insidious Inconsistency, this suggests at least a partial solution to the Problem of Disintegration: namely carefully and explicitly developing (indeed, designing!) consistent metaphysical theories on which new design theories can be based (a 'prophylactic treatment'). I shall call such foundations *worldviews*. I see their proper development as a major task for the branch of design research known as the *philosophy of design* (see, for example, Galle, 2002). Alleviating the Problem of Disintegration is not the sole purpose of worldviews for design theory; they may also provide philosophical insights into the nature of design that are direct contributions to design theory in their own right. This will become clear in sections 4 and 5 where I propose and explain a method for the design of worldviews for design theory. But to be well equipped, we need the material in section 2.

2. Shaping the line of inquiry

Despite my reservations about Buchanan's celebration of pluralism, I do not hesitate to take his dictum about *definitions* to heart: for indeed they 'serve the purpose of shaping a particular line of inquiry' (*op. cit.*). So to shape mine, I'll discuss how 'design' might be defined in the interest of unity. But first I'll suggest an *analogy* to illuminate the key concept of 'worldview'; which, I think, is another useful way of 'shaping my line of inquiry'. And finally, I'll shape it in a third way – by placing it in *context* of related work.

2.1. Worldviews: the software analogy

Let us expand our stock of metaphorical imagery, not only for general clarification, but also for later use as a vehicle for explanation. As Table 1 shows, I see an analogy between *software development* and *design research*.

Table 1. Analogy between software development and design research.[4]

Software development.	Design research.
Application programs.	Design theories.
Operating systems: 'platforms'.	Underlying metaphysical theories: 'worldviews'.
Hardware.	Reality.

Non-philosophical empirical design theories are to design research what application programs are to software development. In the world of software, an operating system such as Windows, Mac OS, or Linux ('platforms' in the jargon), provides 'low-level' functionality to application programs (detecting a keystroke, allocating a file, sounding the beep, etc.), and enables them to run concurrently on the hardware sharing its resources in a coordinated manner. Likewise, a 'worldview' should provide design theories with 'low-level' means for

3 Please do not surmise from the use and wording of this quotation that I might be pursuing some reductionist programme of turning design or design research into a (natural, positivist, 'hard', or 'objective') *science*. I am not.

4 The analogy could be generalised by substituting other terms for 'design'.

understanding reality (conceptions of properties, agency, time, etc.), and enable us to express knowledge and understanding of various aspects of design in a principled manner, so as to ensure internal and mutual consistency of our theories. The analogy abruptly ends, however, when it comes to the levels of development and awareness. Whereas sophisticated operating systems are commonplace in computing, in design research we still have, metaphorically speaking, a good deal of 'systems programming' to do.

Table 2. Shortcomings in application programs and design theories.

Application programs.	Design theories.
Incompatible file formats, no cut & paste.	Incompatible terminology.
Unavailability for same platform.	Incompatible worldviews.
Crashing.	Inconsistency.

But software has its shortcomings; and these have counterparts among design theories (Table 2). Though sometimes using 'stand-alone programs', we generally expect applications to be 'integrated'; i.e., smoothly exchange data. If they lack shared file formats or support for cut & paste, exchange is impossible, or else requires bothersome 'conversions'. Analogously, two terminologically un-coordinated design theories may not immediately combine into a seamless picture, even if their authors agree on the subject matter.

More seriously, a program you might wish to use may not be available for your platform. And just as we shall have to live with competing platforms, so we should probably never expect philosophers of design to agree on recommending a single worldview. Even if they did, it would probably not accepted by all design theorists. What we *can* hope, is that a small number of worldviews will survive competition and criticism (as was the case with computer platforms), and that each of them will integrate and unify theories based on it.

Worse still, are programs that crash because of fatal 'bugs'. Their counterparts are theories that are internally inconsistent; i.e. contradict themselves. Just as 'bugs' may lurk in both application programs and the underlying platform, inconsistency in theories may be local to them, or stem from a faulty worldview.

2.2. Defining 'design'

To make proper sense of such general talk of design theories, we need to define 'design' – as broadly and un-controversially as is possible, without watering down the concept. Friedman (2003) recommends Simon's much-cited definition as a 'useful starting point' because 'it covers most forms of design':

'Everyone designs who devises courses of action aimed at changing existing situations into preferred ones.' (Simon, 1996, p. 111).

Indeed, this 'covers most forms of design'. It also covers (forgive me the example) my planning to pick my nose when no one looks. But I cannot imagine why we should extend the scope of design research that far; the definition needs fine-tuning. It centres on *planning*, rather than actual change. This conveniently allows us to

talk of design that never gets 'carried out'. What is wrong with the definition is the *aim* of planning, as we just saw. So for our present purposes, I suggest instead:

Everyone *designs* who devises courses of action aimed at the production of an *artefact*.

Which still leaves us with the burden of defining 'artefact'. Fortunately, this has been dealt with in great philosophical depth by Dipert (1993), and more recently by Hilpinen whose basic definition reads:

'[Artefact:] an object that has been intentionally made or produced for a certain purpose.' (Hilpinen, 2004).
Note how 'purpose' preserves the teleological aspect of Simon's definition.

2.3. The quest for unity

Whatever diversifies design and design research is potentially a source of disintegration in the overall 'body' of design theory. But the history of *controversy* in design research is long (Bayazit, 2004; Cross, 2002). Let me concentrate instead on the few deliberate attempts at promoting *unity* that I am aware of.

Hubka and Eder (1996) attempted to lay down foundations for a general 'Design Science'. They limit their scope to *engineering*, but even then, the project is ambitious. They define their science as 'a system of logically related knowledge, which should contain and organize *the complete knowledge about and for designing*' (p 73, emphasis added). I sympathize with their notion of 'logically related knowledge', but fail to see how it could ever become 'complete' in a changing world.

Love's meta-theoretical method (Galle, 2001; Love, 2000) devised to 'clarify the existing state of design theory' and 'assist with the establishment of coherence and compatibility between concepts in disparate theories' shares its aim with the method I am about to present. I believe the methods may supplement each other. Love's elaboration of the vision of unified cross-disciplinary design theory (Love, 2002b) motivates his method. In metaphorical terms of computing, however, he advocates a single 'platform' for all 'application programs' to run on. This is a notch above what I consider the suitable level of ambition. And we must part company when it comes to his proposal that coherence in design theory be based on 'brain and neurological research' (Love, 2002a).

Given our definition of design in terms of artefacts, it is interesting to note how the range of artefacts has expanded during the 20th century. In addition to traditional graphic and material artefacts, less tangible ones, such as services and organizations, emerged during the 20th century: 'the four orders of design' (Buchanan, 1998, 2004). As each 'order' is diverse in itself, this poses a tremendous challenge to design researchers, if they are to capture some notion of 'unity' across this broad spectrum. As a promising approach to this problem Stacey *et al.* (2002) suggest that unity, rather than stemming from a shared essence, comes from characteristics shared by many but not all design processes – a perfect parallel to Wittgenstein's (1984, §§67-68) idea of 'family resemblances' among games.

3. How sloppy metaphysics may induce insidious inconsistency in theories

To support the plausibility of my 'Suspicion of Insidious Inconsistency', I'll first consider two examples by Goggans (1999) of how inconsistency may threaten if we are unaware of the (metaphysical) context in which we speak; and then add a more design-related example of my own.

Goggans' simplest example (p 299) is not metaphysical in nature, but offers a powerful analogue. Imagine a captain standing at the helm of a sailing ship. Someone onboard the ship says,

(1) "The captain is not moving".

Another observer on the coast says,

(2) "The captain is moving".

Sentences (1) and (2) both correctly describe the situation; yet formally contradict each other! To solve this logical problem, Goggans argues, we must deny the sentences any *propositional content,* when considered in isolation. Each of them expresses a proposition only relatively to, and depending on, a *spatial frame of reference.*

But since (1) and (2) were uttered within different spatial frames of reference (on the ship and the coast, respectively) there need not be any contradiction between the *propositions* they express. In other words, the contradiction only occurs if (1) and (2) are interpreted as if they belonged to the same spatial frame of reference (say, as if they had both been uttered onboard the ship). The morale: Never combine kinetic sentences with different spatial frames of reference!

Another of Goggans' examples concerns two descriptions of a very simple world (pp 296 f, slightly condensed here):

(3) There are three oxygen atoms with their centres located exactly two inches from each other. There are no other material objects than the three atoms.

(4) There are three oxygen atoms with their centres located exactly two inches from each other. In addition there is another object of which all three atoms are parts. There are no other material objects besides the three atoms and that which they compose.

Here, too, we have two descriptions of the same facts, but again there would seem to be a contradiction, for does not (3) say that there are three material objects, and (4) that there are *not* three material objects (because there are four)? No, Goggans insists (pp 304 f): '[t]here is no such thing as the proposition that there are exactly three things, considered in abstraction from any *systematic way of describing the world.* There are the various propositions those words express, considered relative to various *interpretive frameworks*' (my Italics). The interpretive framework, the 'systematic way of describing the world', corresponds to the spatial frames of reference of the previous example. (For convenience of exposition, I shall use '*frame of reference*' as a generic term covering the meaning of 'spatial frame of reference', 'interpretive framework', alias 'systematic ways of

describing the world'.) And so the morale is analogous to the previous one: Never combine sentences about the material world that have different frames of reference!

Descriptions (1) through (4) can, I think, be read as toy examples of statements of a design theory, the 'frames of reference' corresponding to what I called 'a worldview'. When Goggans warns us not to mix the frames of reference, it corresponds to our requirement that a worldview be *consistent*. Mixing frames of reference is to admit inconsistent assumptions into one's worldview. (In metaphorical terms of systems programming: 'introducing bugs into the operating system by composing it from modules that don't work properly together'.) In the ship case we could spell them out as follows: 'observations are made from the ship' contra 'observations are made from the coast' (hence 'observations are *not* made from the ship'). In the three-atoms example, the inconsistency between (3) and (4) is similarly based on a deeper inconsistency in the world-view about accepting and not accepting the metaphysical principle of composition.

Let me offer an additional example to show how a sloppy worldview may conceal inconsistency in a more subtle way. Suppose that a mathematically minded design theorist speaks of 'the set of all chairs that …' (say, chairs that satisfy certain requirements); suppose that he thinks of chairs and other material artefacts as perishable (as normally we all do); and suppose that he conceives of sets as abstract entities (also quite a conventional thing to do). Then he has implicitly adopted a worldview in which sets are abstract and can have perishable members.

An abstract set *S* with perishable members would persist through the loss of one of its members, *a*. For, by the standard definition of 'abstract' (Lowe, 1995, p. 513 f), sets are non-spatiotemporal, hence cannot perish themselves. But *S* before and *S* after the loss of *a* would not have the same members. According to the standard identity condition for sets, they are identical if and only if they have the same members. So *S* after the loss of *a* could not be the same set as *S* before the loss of *a*. In other words, *S* would *not* persist through the loss of *a*, which contradicts the initial assumption.

Morale: even apparently plausible and conventional assumptions can render a worldview inconsistent!
Even though the three examples are artificially simple, it is easy to imagine that one could speak of captains, oxygen atoms and chairs in the manner indicated, without noticing the 'insidious' inconsistency. Or, as Goggan's two examples suggest, one might notice the inconsistency, but mistake it for genuine disagreement on the subject matter.

4. How to develop good competing worldviews for design theory
One of Goggan's important insights is that *in principle, frames of reference are arbitrary; be they spatial or metaphysical* (1999, p. 305 f). Thus we can observe the captain equally well stipulating observations from the ship as a frame of reference, or observations from the coast. And (taking another example by Goggans) we can describe the movements in the solar system relatively to any stipulated frame of reference; e.g. assuming either the Sun or one of the planets to be 'stationary'. The same arbitrariness applies to metaphysical frames of reference for descriptions of physical objects, as in the three-atoms example. The two descriptions (3) and (4) are about the

same reality; the question of whether or not there is a fourth composite object is not a matter-of-fact to be decided by observation. It is a metaphysical question. The answer we stipulate defines one frame of reference, or another incompatible but equally good one. ('More than one good computer platform is on the market.')

Another point that Goggans seems to be making (p 306), is that just as putatively empirical sentences about movements or about material objects are void of propositional content as long as they are considered in isolation from a suitable frame of reference ('no application programs run without a platform'), so statements about the frames of reference, although they make sense, say nothing about the world ('what's the use of a platform without applications?'). If I say, 'the Planet Earth is stationary' it is a mere stipulation of the Earth as my spatial frame of reference, not a fact about the world (outside me). Similarly, if I adopt the metaphysical doctrine that for any multiplicity of material objects, there exists a material object composed of them, I have said nothing about the material world. But I have stipulated a way in which I want to understand and describe the material world. This neutrality of frame-of-reference talk with respect to the world explains, I think, the freedom we have in choosing frames of reference: there are no empirical facts to dictate our choice.

But even so, the choice of a frame of reference is significant. For, as Goggans concludes his analysis, 'we may resolve to describe the world […] in a way that is outwardly consistent with [the frame of reference], that is, […] in a way that does not *formally* contradict [it]. This results in a description that is more principled and systematic than our ordinary descriptions.'

Producing descriptions of the world that are 'more principled and systematic than our ordinary descriptions' is precisely what researchers should do. As already suggested in section 3, I see nothing that prevents us from scaling up Goggan's insights, *mutatis mutandis*, to apply to design theories in general. All it takes is to translate his talk of 'descriptions of the world' relatively to 'frames of reference', into similar talk of 'developing design theories' relatively to *consistent worldviews*.

This is what made me suggest (at the end of section 1) the somewhat ambitious project of 'designing' the foundations of design theory. What I mean is that we should seek out candidate worldviews in terms of which we may state our findings about design in a 'more principled and systematic' way than we could otherwise do. The design metaphor seems appropriate, because the problem is 'ill-defined' in that, as just explained, our 'solution space' is virtually unlimited. Yet there are certain 'design criteria' to be observed (among them aesthetic ones, which strengthens the design metaphor):

- *Consistency*, in order to avoid such pitfalls as discussed in section 3.
- *Viability* under philosophical criticism and competition from alternative theories.
- *Elegance,* e.g. in terms conceptual parsimony, explanatory power, and non-violation of intuition and common linguistic practice.
- *Philosophical relevance to design*; i.e., ability to provide conceptual and terminological resources for explicating design and related notions. This amounts to supporting a *philosophy of design*.

- *Theoretical relevance to design*; i.e., ability to support, likewise, the formulation of (empirical) theories of design research, in a 'principled and systematic' way. This amounts to supporting the desired body of design theory itself.

To generate and evaluate candidate worldviews I propose the following steps:[5]

- Raising one or more philosophical 'seed questions' about what seems fundamental aspects of design; i.e., questions which seem to have the potential to lead to answers that constitute philosophically relevant worldviews).
- Using these questions as 'seeds' from which to grow sufficiently comprehensive metaphysical theories, the candidate worldviews.
- Subjecting the resulting candidate worldviews to philosophical scrutiny including, but not limited to, evaluation against the criteria of consistency, viability, elegance, and philosophical relevance to design.
- For a number of design theories, develop each of them *in terms of* ('outwardly consistent with', in Goggan's words) as many of the candidate worldviews as possible, and compare their theoretical relevance to design.

Obviously, this amounts to a major research programme, most of which remains to be carried out. Suffice it for now to take a look at the first two steps.

5. Raising and using the 'seed questions'

To exemplify what 'seed questions' could be like, let me first explain why I think *prediction* is a fundamental aspect of design, and then develop some philosophical questions about, and related to, prediction in design.

5.1. Prediction in design

For the production of an artefact to succeed, the designer must make reliable predictions about what the artefact will be like: how it will look, behave or serve its user. For example, an architect in charge of an opera house project might point to one of his drawings, saying 'every seat on this balcony has an unobstructed view of the stage'. If we could not rely on such design predictions as largely true[6], we should hardly be able to make artefacts at all, except perhaps very simple ones by pure chance. For without reliable predictions one course of action would seem as good as another, and we should soon loose our sense of direction. As Friedman (2003, p. 521) explains (in the teleological language of Simon's definition, see 2.2 above), design must be able to 'cause change toward desired goals'; hence to 'create *predictable* – or reasonable – changes to reach them' (italics mine). The production of complex artefacts sometimes takes place concurrently with their design, for reasons of efficiency. But that does not eliminate the need for prediction through and during design. At some sufficiently detailed level, *prediction is prior to production*. (Otherwise designing would be utterly futile, for whatever someone designed would either have been produced already, or no such thing would ever be produced.) For example, we might construct the basement walls of an opera house before finishing balcony design; but presumably

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5 For the sake of presentation I list them as a linear sequence. As in any non-trivial design project, the actual process will be more chaotic, involving iterations and overlaps.

6 The occasional mistake will not render rational and successful production impossible in the long run.

basement wall design is completed before the basement walls are produced, and balcony design is completed before the balcony is produced.

On the face of things, making predictions in design amounts to describing relevant properties of artefacts. In design practice such predictions are accepted without qualms. However, at the time an artefact (e.g., a balcony) was designed there was no such artefact to have any properties. Returning to our example about the architect in charge of the opera project, let us suppose he utters the sentence 'every seat on this balcony has an unobstructed view of the stage' while he is in the middle of his balcony design. Then, strictly speaking, there *is* no balcony to have the property of *affording users a good view of the stage*. (Indeed, there may be no stage either, to have the property of *being visible from the balcony seats*.[7]) So for (at least some of) the singular terms of the designer's predictive statements ('this balcony', say) there would seem to be nothing to refer to. Thus contrary to our *prima facie* understanding of design predictions, and contrary to what they purport to be, it is not at all clear that they are descriptions of properties of an artefact.

5.2. 'Seed questions'

From a philosophical point of view such puzzlement is not to be shrugged off, but to be taken seriously as a call for clarification. A challenge that, as I see it, can be expressed by the following four questions:

(5) If the singular terms of design predictions do *not* refer, how and in what sense can the predictions be true or even meaningful?

(6) If those terms *do* refer, to what category of entities are they referring?[8]

Questions 5 and 6 form a kind of dilemma: no matter whether we assume that the singular terms refer or that they do not, we are left with a non-trivial question to answer. By overcoming this '*dilemma of reference*'[9] as I shall call it, we may be able to clarify the fundamental *ontological* question:

(7) What is the subject area of design (given that it cannot be the actual artefacts themselves)?

It would seem that if the singular terms of design discourse do not refer, then design does not *have* any subject area; but if they do refer (but cannot refer to an artefact), then it is by no means evident what design discourse is all about, and so what the subject area of design might be. Either way, we face considerable embarrassment about the status of design as an intellectual discipline. It is part of our challenge to avoid such embarrassment.

Finally, a testing stone of any candidate ontology for design is that it helps or enables us answer the *epistemological* question of design:

(8) How can the designer *know* the truth of his predictions (or at least justify his faith in them)?

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7 One might talk about a *relation* between balcony and stage, or among balcony, stage, and seats, rather than properties of either balcony, stage, or each of the seats. The distinction is unimportant here, so we subsume relations under properties.

8 In the opera example I suggested that 'the stage' might refer to a stage already constructed when the prediction was made. But such genuinely referring terms are uninteresting here, so we shall ignore them.

9 Just as design theory may draw on auxiliary disciplines (ergonomics etc.), the philosophy of design may draw on other disciplines; in this case the philosophy of language. For a discussion relevant to the present 'dilemma' of reference, see e.g. (Vision, 1986).

5.3. Sketch of a worldview

Developing candidate worldviews is one of the most laborious steps of the method, but in return may yield direct philosophical insights into design. Let us very briefly consider an example for illustration.

A strategy to the effect that predictions *do refer* to artefacts after all (as they purport to do), would be to tame the 'dilemma of reference' by playing down the importance of *predictions*, and to do so by playing down the importance of *time*. We could adopt an *eternalist theory of time*, according to which everything there is in the (concrete) world – notably artefacts – inhabits a region of a 4-dimensional space-time continuum, such that past and present entities have no privileged status over future ones (Loux, 1998, p. 207 ff.; Quine, 1982, section 3.1); in other words, future entities are considered just as 'real' as present ones. The predictions then reduce to mere descriptions of *future artefacts* (seed question 6) which are what design is all about (seed question 7), and we can know about them (seed question 8) because they are of the same nature and ontological stature as past and present artefacts.

Seductively simple though this strategy may seem, it only works if we assume that every artefact a designer ever designs is eventually produced; otherwise it could not be 'a future artefact' at the time of designing. A problem for this approach is therefore to explain (away) the fact that design is often undertaken as part of a project that is given up before any artefact is produced. Independently of this objection, the eternalist view would also have to be defended against arguments in support of the incompatible thesis that 'the past is different from the future because the past exists and the future does not' (Diekemper, 2005, p. 239).

6. Concluding remarks

The sketch offered above is neither recommended nor rejected as a candidate worldview; its sole purpose was to complete the explanation of the proposed method of world-view 'design'. Obviously a good many candidate worldviews should be developed and examined in substantial detail, before we can begin to base design theory on them. Yet I hope I have shown enough already to have made a case for my contention: that addressing the Problem of Disintegration by deliberately 'designing' and testing candidate worldviews for design theory is not only possible, but – given the pitfalls of sloppy metaphysics – much preferable to sitting back and letting things happen.

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