

The Abduction of the Future

Between inventive thinking and speculative design

Original study

Salvatore Zingale (ORCID: <https://orcid.org/0000-0002-1020-9276>)
Dipartimento di Design, Politecnico di Milano, Italy (salvatore.zingale@polimi.it)

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Abstract: Evolutionary history, writes Peirce, teaches us that the future influences the present: it conditions it, puts it into question, and places it in a state of planning. To be in evolution, as well as to feel part of a history, means to project oneself, to form an idea, a prefiguration, of what we could be in a future state, no matter how distant.

The logical form of every design and the inventive process is *abduction*, in particular projective abduction, which proposes as the object of discovery an object or event that has yet to be realized. In this sense, abduction can also be defined as the *semiotics of the possible*. Is it possible to outline an abductive design method?

My contribution aims to discuss how abduction, and with it, everything that contributes to the formation of an *inventive habit*, can be considered as the ineliminable step of every design process. This is the case of Speculative Design, which has had the credit of introducing the notion of possibility into design thinking.

Keywords: Abduction, Future, Inventiveness, Speculative Design, Project-making.

1. INTRODUCTION: BEFORE AND AFTER THE TEXT

It is the widespread opinion of many scholars of semiotics, even among the most authoritative ones, that the task of this discipline is to investigate how texts are presented, through an analytical work of disassembly and reassembly; on the contrary, the question of why texts have been produced in a certain way would not be among the tasks of semiotics. Similarly, any question about the intentions of sign production would remain excluded, or at least marginal. Similarly, one is inclined to think that this type of question is unfathomable, that it belongs to other disciplines, first and foremost psychology, and that semiotics limits its mandate to the sphere of textuality and the systems of signification from which it originates. Everything that transcends the boundaries of the text is thus kept outside the interest of the semiotician.

This position is justifiably justified by the need to concentrate the discipline's methodological scope, refine its

tools, and prevent it from overflowing in every direction, thus weakening itself. However, since semiotics first has to dialogue with project practices – such as those of design, but not only – and then deal with the paths that these practices follow, i.e., the processes by which a certain artefact takes on that specific textual configuration, or other similar ones, considering only what lies within the confines of the text proves insufficient. In such cases, semiotics is required to make the effort to undertake a journey before and after the boundaries of textuality, to walk towards what transcends them, even at the risk of coming up empty-handed. However, we know that the reason for the journey is already necessary.

Similarly, it may be insufficient to place the objects of study only in the present time, or in the past. What if what we want to investigate does not belong – or does not yet belong – to our time, to our current social conditions, to

The Abduction of the Future

what we can control and verify? In other words: how can we interpret what is *possible*?

2. COGNITION AND SPECULATION

In this essay, I will refer to a much-discussed field of design enquiry that has been as much a source of enthusiasm as it has been of rejection: Speculative Design. It was first formulated in a book by Anthony Dunne and Fiona Raby: *Speculative Everything: design, fiction, and social dreaming* (Dunne, Raby 2013).¹ However, Speculative Design has a stimulating and confrontational function here. It interests me above all because it introduces into design culture, explicitly and as an object of research, some themes that concern cognitive semiotics, that is, semiotics that, as Claudio Paolucci (2021a, 2021b) summarises, concern the way we know the world. It is therefore a semiotics with an epistemological vocation that derives from two assumptions put forward by Charles S. Peirce as the basis of his philosophy, the four anti-Cartesian principles, of which we will consider two: “1. We have no power of Introspection, but all knowledge of the internal world is derived by hypothetical reasoning from our knowledge of external facts”; “3. We have no power of thinking without signs” (CP 5.265).

In addition to this, the semiotic interest in Speculative Design is motivated using the notion of *Possibility*, which as we can see from the well-known “cone” (fig. e 1.) is placed as the end of the design action.

The reference to the possible (as well as plausible, probable, and above all desirable) future requires an act that the authors define as an act of imagination, which I prefer to call prefiguration, which can also come from an act of association of ideas, from a heuristic use of metaphor, from any form of epiphany. To prefigure, therefore, is to place a figure before oneself, present in the mind even before the artefactual world. Present, I would say, only in hypothesis, and therefore as the result of abductive inference. I will base a large part of this essay on abduction, and in part on a review of it in a projectual key.²

Speculative Design does not aim to produce artefacts properly but understands design as “conceptual design—design about ideas” (Dunne, Raby 2013, 11). We could also say that it is an experimental practice, proceeding by hypothetical and demonstrative scenarios, based on the exercise of our imaginative faculties in prefiguring possible futures. It, therefore, disregards any commercial link with design. The aim is to place models and prototypes at the centre of the image. Narrative and expositional actions are used to present results and products: “[...] the word ‘fiction’ before design immediately informs the viewer that the object is not real; ‘probes’ infer that the object is part of an investigation, and both ‘discursive’ and ‘critical’ reveal the intentions of the object as an instigator of debate or philosophical analysis” (Auger 2013).

Naive or wild visions of the future are avoided, like certain spectacular and technocentric machines of much trivial science fiction. On the contrary, Speculative Design

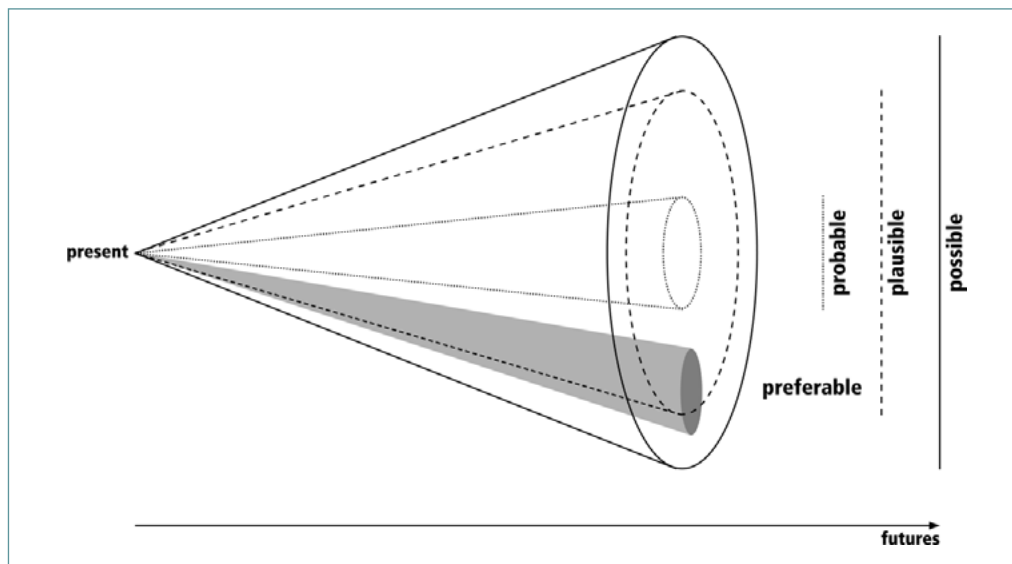


Figure 1. The “cone” of Speculative Design. My re-elaboration from Dunne & Raby (2013, 2–6).

1 In this book, Dunne and Raby also introduce the notion of Critical Design. Although the adjective ‘critical’ is not related to either Kantian philosophy or the ‘Kritische Theorie’ of the Frankfurt School, what the two authors introduce, in my opinion, is precisely a double necessity: firstly, to question current and acquired knowledge, which is often steeped in unverified assumptions if not inherited stereotypes; secondly, to use design as a tool to try to bring out and question the very assumptions that underpin “thinking through design” (cf. Dunne, Raby 2013, 35). For an overview of Critical Design see Malpass (2017).

2 On abduction and its role in inventive thought I refer to Aliseda (2006), Bonfantini (1987, 2021), Club Psòmega (1986), Eco and Sebeok (1988), Magnani (2001, 2017), Proni (2017), Zingale (2012)

is about conjecture – i.e. abduction – around what events might occur, and what design responses we can think of, in cases where: (i) technology should develop in certain directions or undertake developments that are unthinkable at the moment and yet plausible; (ii) certain problematic realities cannot be solved in the present, but we can begin to think about how they can be overcome; (iii) the present organisations and forms of social coexistence are insufficient to sustain our standards of living. These are only three general cases. A conscious reflection on the state and conditions of life we are living in could increase this schematic case study. We know that the development of digital technologies is capable of profoundly modifying both our interpersonal relationships and our living environments. We know that the development of digital technologies is capable of profoundly modifying both our interpersonal relationships and our living environments. It is not far-fetched to argue that the Internet has not only entered our lives but, in many respects, our bodies as well, and is increasingly influencing our ways of thinking and acting.³

Beyond what has been experimented with so far and what its applications might be, what we can say is that Speculative Design aims to better understand the present through an intense questioning of the future. This aim also involves an open critique of design and industrial production. Speculative Design projects, in other words, are precisely the modalities of this questioning and criticism. It is no coincidence that in a previous book Dunne and Raby (2001) argued that all too often design ends up having the purpose of fuelling industrial production and technology, having as its main aim to “still to provide new products – smaller, faster, different, better” (Dunne, Raby 2001, 58).

3. SPECULATION AND ABDUCTION

The criticism of the present and the effort to prepare the future, beyond the judgment and opinions on speculative design, lead me to take up a semiotic theme that has been with me for some time: the role of abduction in our design actions. It should be specified, however, that the *projectuality*⁴ (or *project-making attitude*) I am talking about is not a mental activity peculiar only to design but also to our life conducts, individual and collective, cultural, and political (Zingale 2012, 2022). And the future is not

a time that does not yet exist, it is time that is already here, nestling in our choices and beliefs.

The theme of the future is recurrent in Peirce's thought as if it were an ineliminable element of the pragmatist vision and abductive inference. (CP 5.487); and that of the logical interpreter: “The logical interpretant must, [...] be in a relatively future tense” (CP 5.481).⁵

In the terms of abduction and inventive thinking, the future is as much absent as it is possible. It is what is not there, but it is what cannot be there: the future is an inevitable possibility. But above all, the idea we have of the future is what conditions and determines our present:

To say that the future does not influence the present is untenable doctrine. It is as much to say that there are no final causes, or ends. The organic world is full of refutations of that position. (CP 2.86)

If we do research, if we write essays on design, if we claim to teach others what we believe in, it is because both we and our readers or students are acting towards the future. Even when it appears obscure and indecipherable. We could say that the future to be built – as well as, for other reasons, the past to be understood – is our main dynamic object, an object to be interpreted and whose interpretation defines the shape of social organization.

This is the reason why, if acquired by the scientific method, even beliefs about the past refer to the future – as, for example, those about the discovery of America: “a belief that Christopher Columbus discovered America really refers to the future” (CP 5.461). This is not a paradox, but the explanation that the future we have physically in front of us is a consequence of the beliefs we have about the past behind us. An example of this can be found in ideological diatribes: denying the existence of the holocaust or witnessing and documenting its memory means planning two diametrically opposed futures (cf. Pisanty 1998, 2012).

When we investigate the history of the world or when we dig into our childhood, it is the future that is the actual object of our interest. But an investigation is anything but just an analysis of what exists, it is about hypotheses and abductions.

3 A TV series that implicitly refers to speculative design is *Black Mirror*, not surprisingly called “speculative fiction”. Created by Charlie Brooker in 2011 for Channel 4 (UK), despite being set in the near future *Black Mirror* speaks to us about the world of today, the problems of our present-day and the issues posed by new technologies and the media system.

4 In Italian, I use the term *progettualità* in the sense provided by the Treccani Online Dictionary: «tendenza, propensione a fare progetti, programmare» (English: “Tendency, predisposition to make projects, to plan”). In English, I could not find any direct equivalent, so I am paraphrasing it as project-making attitude. Seldom, it is possible to find the word projectuality in academic writing, but neither the term is found in any dictionary, nor I am sure whether it has the same meaning I intend. Cf. Shahar (2011).

5 CP refers to the *Collected Papers* of Charles Peirce (1931–1958). The following numbers refer to the volume and paragraph.

4. THE DIRECTIONS OF ABDUCTION

I will not dwell here on what is meant by “abduction”,⁶ I will simply point out that it is far from the linear *movement* of thought; sometimes unconscious or occasional (as in the case of serendipity), hardly explainable even by those who carry it out. But to stay about this essay, it is worth noting that this movement can proceed in three different directions: in the present, towards the past, and towards the future. In addition to this, however, it is necessary to fix the *starting point* of an abduction: what Peirce called a *surprising fact* or also *curious circumstance*⁷ and which, when we will deal with projective abduction applied to design (§§ 5. and 6.), I propose to call *problematic fact*.

I resort to a diagrammatic visualisation (fig. 2) and represent the existence of any problematic fact using a point (P) and the *possible absent*, i.e., the result of abduction, with three vectors (a, b, c) originating at that point:

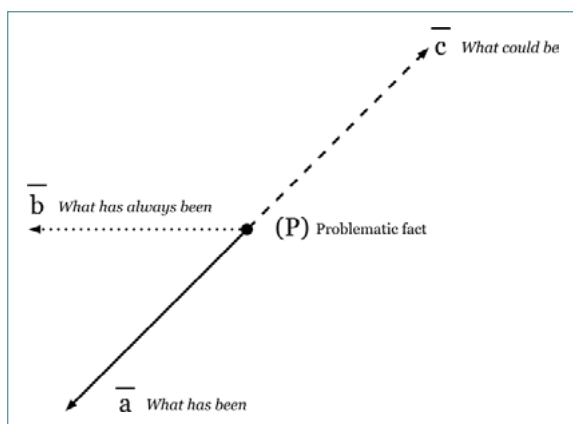


Figure 2. Temporal location of the possible absent.

Vector (a) is oriented downwards and designates a movement towards the past; vector (c) is instead oriented upwards, to designate a movement towards the future. Vector (b) is situated in the same plane as point P, i.e., it is contemporaneous with it or temporally irrelevant.

The problematic fact (P) is always located in the present moment, in the here and now. This means that it is historically determined, inscribed in a history that begins from the moment one becomes aware of its existence. From here, as in a virtual narrative, a movement originates that can be associated either with *analexis* (the flashback that rewinds the sequence of events) or *prolexis* (the flashforward that anticipates events that have yet to happen).

Depending on the direction of each vector, we thus obtain three distinct ways of making use of abduction, i.e., three abductive modes:⁸

(a) towards what *has been or happened*: judicial abduction;⁹

(b) towards what *has always been*: scientific abduction;

(c) towards what *is not but is possible to be*: projective abduction.

Using and adapting to our case some terms of modal logic, we say that vectors (a) and (b) behave according to a mode I would call *necessary possibility* (“This bloodstain belongs to x, so it is x who has lost blood”; or: “The volume of water displaced is equal to y because y is the volume of the part of the body immersed”); vector (c) behaves differently, according to a mode I call *elective possibility* (“If I start a diet seriously, then I will be able to lose weight”).

Vector (a) moves downwards in turn, while (b) moves in a lateral direction. The first (a) looks for a cause in a past time with respect to the observation of a present fact; the second (b) looks instead for what has always been present, i.e., universal entities or entities with no temporal determination.

This difference is well grasped by Massimo Bonfantini when he discusses the “relationship between the investigative rationality of the detective (exemplified in Conan Doyle’s Sherlock Holmes) and the rationality of scientific research according to Peirce” (Bonfantini 1987, 59).¹⁰ In fact, Bonfantini explains, there would be several types of abduction, exemplified by their applications in the field of judicial or scientific investigation. Even if in both cases “the devising of hypotheses about the unknown causes of the results constitutes the decisive moment of the research”, it is the starting intentions and the aims of the two types of investigation that lead to different *places*: “in the police investigation it is a matter of going back from a particular event to its particular cause; in the scientific investigation it is a matter of finding a fundamental general theoretical law, or (more often) it is a matter of bringing an anomalous fact back into the sphere of validity of a fundamental law by rearranging the ‘intermediate’ laws” (Bonfantini 1987, 60).

But if in this passage Bonfantini grasps the difference between the directions of the vectors (a) and (b) of the diagram, both determined by a certain kind of necessity, we must also account for the direction of the vector (c), the one that moves towards possibility. Thus, we observe that:

6 For an understanding of abduction and on the different classifications that have been developed I refer to Bonfantini (1987, 2021), Eco and Sebeok (1988), Magnani (2001, 2017), Proni (2017), Zingale (2012).

7 “Hypothesis is where we find some very curious circumstance, which would be explained by the supposition that it was a case of a certain general rule, and thereupon adopt that supposition” (CP 2.624).

8 These three modes do not correspond to the three types of abduction of Bonfantini (1987, 2021) that I illustrated in Zingale (2012). Nor do they replace them.

9 Also called *Retroduction* by Peirce (CP 2.755).

10 All quotations from Bonfantini have been translated by me.

Zingale

- in (a) the cause sought (*the one who lost blood*) precedes the phenomenon observed (*the bloodstain*);
- in (b) the cause found (*the immersion of a body*) pre-exists the effect observed (*the volume of water displaced*);
- in (c) a certain action is carried out (*starting a diet*) to prepare or design a certain effect (*losing weight*).

5. THREE ABDUCTIONS

Abduction can be symbolically expressed by a formula, which illustrates a well-known passage by Peirce:

The surprising fact, C, is observed;

- But if A were true, C would be a matter of course,
- Hence, there is reason to suspect that A is true. (CP 5.189)

The formula, with a brief explanation, is as follows:

	C	There is a consequent C
A ⇒ C		The existence of an antecedent A would explain C
A		There is an antecedent A (maybe)

This is not the only formal representation of abduction. I shall therefore also try another type of formalisation. In this case, I will use a different symbology, in order not to be conditioned by the temporal connotation that the terms Antecedent and Consequent carry:

- the symbol Θ stands for any observed *problematic fact* that comes to mind;
 - the symbol \Rightarrow stands for any *founded implication* in the available encyclopaedic knowledge;
 - the symbol Ψ stands for the hypothetical *explanation* of the problematic fact.
- These three symbols, i.e., the three moments of abductive inference, can be declined in the three abductive modes:

Judicial abduction

- Θ *Observed problematic fact*
- \Rightarrow *Encyclopaedic implication available*
- Ψ *Causative fact*

Heuristic abduction

- Θ *Observed problematic fact*
- \Rightarrow *Encyclopaedic implication investigated*
- Ψ *Discovery fact*

Projective abduction

- Θ *Observed problematic fact*
- \Rightarrow *Encyclopaedic implication prefigured*
- Ψ *Designed fact*

5.1. JUDICIAL ABDUCTION

The first case I give as an example is selective abduction (the second type of abduction of Bonfantini and Proni 1980), a fact that can be explained from experience and the available encyclopaedia.

Θ *Observed fact*: Mr. Sigma enters his friend's house and smells an unpleasant stench of cigar smoke. This fact becomes problematic for several reasons (which constitute the mediating criteria): because it causes annoyance or discomfort, because it is an indication of an unacceptable situation, etc.

\Rightarrow *Encyclopaedic implication available*: Mr. Sigma knows that his friend used to be a cigar smoker, although he had later quit.

Ψ *Causative fact*: Mr. Sigma suspects that in that room the cigar was smoked by another person.

5.2. HEURISTIC ABDUCTION

The second case I give as an example is the well-known Kepler abduction (the inventive abduction of the third type first subtype of Bonfantini and Proni 1980), i.e., a fact that can be explained by deconstructing or restructuring available beliefs or knowledge.

Θ *Observed fact*: The planet Mars does not always pass through the same points on a circumference, which is believed to be the geometric form of the orbits.

\Rightarrow *Encyclopaedic implication investigated*: The circumference is not the only closed curved line, the ellipse also has such characteristics, although its shape changes.

Ψ *Fact discovered*: The geometric form of orbits is not the circumference but the ellipse.

5.3. PROJECTIVE ABDUCTION

The third case I give as an example is the invention of the "whitewash" by Bette Nesmith Graham¹¹ in the mid-1950s (one of the inventive abductions of the third kind of Bonfantini and Proni 1980), i.e., a fact that is prefigured to design a missing artefact or service.

11 This is a case of inventive design that was in danger of remaining permanently in oblivion, had the New York Times in 2018 not brought it to attention (New York Times 2018).

The Abduction of the Future

Θ *Observed fact*: In typing, many typos are made that cannot be cleanly corrected and that force entire pages to be rewritten.

⇒ *Encyclopaedic implication prefigured*: We can apply a technique to typing similar to that used in painting, applying a whitish covering mixture to the misspelled words.

Ψ *Designed fact*: By refining the technique of chemical mixtures, a thick white liquid is produced which covers typos and allows them to be corrected.

6. VARIANTS OF PROJECTIVE ABDUCTION

Let us dwell on the projective abduction summarised in 5.1. to put the way in which it can occur. In general, an abduction is possible only from the moment in which the mind succeeds in grasping a law of entailment that makes the Consequent dependent on the Antecedent: *A implies C*. In projective abduction, it is not necessarily a law, but a relation that is “seen” between the *problematic fact* Θ and its overcoming, the *designed fact* Ψ . It is from this relationship that the possible prefiguration is derived. It is a relation that has a semiotic value of *mediation*, like the passage across a ford. The Antecedent, in fact, is no longer (not necessarily) a temporal antecedent, but a logical one. It is a fact that comes *before*, but only because its existence will allow a second fact to occur.

In the following, I propose a development in three variants of the formula seen before (§ 5.). To represent these variants we have to switch, by means of the logical operator NOT /-/, both the value of the Consequent and that of its possible Antecedent. Here are the three variants:

6.1. FIRST VARIANT OF PROJECTIVE ABDUCTION

	Θ	Θ is a problematic fact.
Ψ	\Rightarrow $\neg \Theta$	The existence of Ψ implies the removal of Θ .
Ψ		Then I design the possible Ψ .

6.2. SECOND VARIANT OF PROJECTIVE ABDUCTION

	$\neg \Theta$	The lack of Θ is a problematic fact.
Ψ	\Rightarrow Θ	If there were a Ψ , it would imply the existence of Θ .
Ψ		Then I design the possible Ψ .

6.3. THIRD VARIANT OF PROJECTIVE ABDUCTION

	Θ	Θ is a problematic fact.
$\neg \Psi$	\Rightarrow $\neg \Theta$	The lack of Ψ , implies the lack of Θ .
$\neg \Psi$		Then I design the removal of Ψ .

In all three cases, the logical position of the Consequent is a *problematic fact* (Θ). In each of the three cases, the gaze towards Ψ is turned towards the Possible and produces a transformation of the existing conditions. Projective abduction is the mental stratagem we have for changing the state of things, not for describing it or sifting it through an interpretative grid; nor is it the procedure for finding firm and immutable laws. Projective abduction is the form of all project activity.

7. THE MEDIATING IMAGE

The prefiguration that is produced by the relation of implication between Ψ and Θ can also be called the *mediating image*. Abductive reasoning is a kind of mental vision rather than an actual logical calculation. If we want, it is a *parallel vision*, capable of grasping in areas close to us what contributes to the elaboration of an idea, like suddenly noticing the existence of a *possible adjacent* (cf. Kauffman 2000; Johnson 2011). As mentioned, this image presents itself to the mind through cognitive processes that take the form of metaphor, an association of ideas, analogy, and other forms of similarity. László Bíró came up with the idea of the *biros* when he observed the trail left by a ball as it passed through a puddle. Bette Nesmith Graham found the solution to her typing problems by using a painting correction practice as a model. There is no shortage of examples. But what do we actually ‘see’?

We can divide the question into three parts: (1) what do we see? (2) in what form do we see it? (3) why do we notice it?

Whatever the answer, it is always a vision that is not limited to considering what is in the immediately perceptible world, but that draws either on encyclopaedic memory (what we know) or on the imagination (what we wish to know). A vision, I would add, that is often sudden and uncertain, perhaps even ephemeral. Its meaning or value only manifests itself when it takes on a revelatory character, according to a true *epiphany*: a festival of the apparition.

To explain what we should mean by epiphany, the philosopher and ethologist Roberto Marchesini (2014) uses the example of the desire to fly, which derives from the way we humans observe birds and which leads us to think that we could fly too. Or rather: *we see ourselves in flight*.

An inventive leap, therefore, needs to rely on a mediating image, in which that we can observe from experience is condensed. This image – perhaps the heart of every abduction – has a dual role: it challenges available knowledge, because it allows us to outline its limits and show its inadequacy; it reveals unexplored mental or factual objects.

This primacy of the image in abduction, and in general in moments when new knowledge appears, is implicit in a well-known passage by Peirce: “The only way of directly communicating an idea is by means of an icon; and every indirect method of communicating an idea must depend

for its establishment upon the use of an icon" (CP 2.278). It will be said that in this case, Peirce is referring to the 'communication' of an idea, not its elaboration. But what is abduction if not communicating a new idea to oneself? New ideas are as they were seen, *staged*, before they are logically defined and argued.

In *Gestalttheorie* this ability to see, which often occurs suddenly, has been called *Einsicht*, in English *insight* (Köhler 1917; Duncker 1945). Wolfgang Köhler's classic example is that of a chimpanzee that manages to reach food beyond the bars of a cage. After several unsuccessful attempts, the chimp becomes aware of a stick. At that moment he reorganises his knowledge and sees in the stick no longer a generic object to hit, but an extension of his arms, an instrument to take and approach the desired object.

Insight tells us that the overcoming of a problem occurs from the moment *we see something within us*, like a light breaking through the darkness. But this is not intuition, it is semiotic interpretation. The chimpanzee's stick becomes a *sign of something else*. But let us remember what Charles Peirce argued in 1868, namely that any understanding of what happens and what is possible to the mind must necessarily pass through a mediation: "We have no power of thinking without signs" (CP 5.265).

But here the other anti-Cartesian principle also returns: all new cognition derives from knowledge of the external world. The search for the new or the unknown therefore passes through what is already known or familiar; it does not matter whether the familiar is recognised as such or whether it remains hidden in some hidden place of the mind. What matters is the knowledge that somewhere we can find the foothold – the mediating element – to be able to proceed: an image recovered from the experience. An image both in the usual sense of the term, i.e., as a visual element, and in the broader sense of a mental image, as a sensory element that we grasp in the form of a *figure*. It is this mediating image that is the actual "vision" we are looking for. However, it is an image that requires, firstly, to be interpreted and, secondly, transformed; and then, using metaphors or analogies, also recombined and reworked. The duration of this process is indifferent, it can last a blink of an eye or a lifetime. What matters is that it is an image capable of prefiguring and preparing the final epiphany of the inventive process.

We can thus state that, in the process of finding a solution, it is not so much the obtaining of the result that we must focus on, as all the mediating elements that, as in crossing a ford, allow us to pass beyond the river: beyond the problem or the anxiety that drives the imagination. If the mediation phase is productive, the result will not be long in coming.

8. CONCLUSION

This focus on the image, and thus on something observable in experience and history, brings us back to the theme of the essay: preparing or planning the future requires a critical vision of the present. Indeed, the formula Ψ implies Θ should be read as "the future *implies* the present". The future lurks in the folds of the present, it is a development of it. The verb "to imply" should be understood literally: it derives from the Latin *plico* (I wrap) and leads us to the idea of "containing within its folds".

But if the future is wrapped up in the present, then we need to know how to see or discover it. We need to know how to interpret it, i.e., how to translate it from one semiotic condition (that which presents itself in its current expression) to another (that which allows us to have a project in front of us).

Designers and researchers who study or experiment with speculative design do not fail to say, starting with Dunne and Raby, that it is critical design, because they intend to hypothesise societies and cultures which, both through unusual ways of manipulating materials and technologies and through rethinking the form of artefacts, can avoid the problems of today. We have said that Speculative Design, not being aimed at production, does not propose artefacts that are usable and producible. What it wants to be is this: "Speculative Design] It is more of an *attitude* than anything else, a *position* rather than a method" (Dunne, Raby 2007; italics mine). In terms of Peircean semiotics, we would say that Speculative Design aims at grafting into the training of researchers and users of any kind of artefact or service an *inventive habit*, the premise of which is «an embodied critique or commentary on consumer culture» (ibid.).

The acquisition of an inventive habit, in my opinion, is part of the implicit propositions of Speculative Design. Or at least, this is where the interest in the cognitive semiotics in Speculative Design is to be found. This habit can be defined as the tendency, when faced with any problematic situation, to look for stratagems to overcome obstacles and hindrances. Hence the tension towards the future and the assumption of abduction as a constant, though not exclusive, mode of reasoning. Because abduction requires exercise, it needs to be trained and kept active, so that its action occurs whenever circumstances require it. In the practice of design – of that design which Dunne and Raby call "affirmative", the design "that reinforces the status quo" (ibid.) – other types of habit often prevail: the compliant habit, which induces the designers to limit themselves to adapt to the situations in which they find themselves to better govern them; or the repetitive habit, which pushes them not to contemplate anything other than what they already know and possess. In other words, what prevails is not the inventive interpretation, as a translation from the existing to the possible, but the interpretation that certifies a state of fact.

This is not just an ethical position – however much it may be. What is of particular interest here is its

The Abduction of the Future

logical-semiotic dimension. It is a way of understanding interpretative activity as critical and projective interpretation. We have said that, according to Peirce, a habit produces a Final Interpreter (CP 5.481), not because it is final, but because it constitutes the end of a process of learning or experimentation. The inventive habit requires the interpretation to be finalized and to act given a transformation.

REFERENCES

- Aliseda, A., 2006. *Abductive reasoning. Logical investigations into discovery and explanation*. Dordrecht, The Netherlands: Springer.
- Auger, J., 2013. Speculative design: crafting the speculation. *Digital Creativity*, 24(1), 11–35, available at: < <http://dx.doi.org/10.1080/14626268.2013.767276> >.
- Bonfantini, M.A., 1987. *La semiosi e l'abduzione*. Milano: Bompiani.
- Bonfantini, M.A., 2021. *Scritti sull'inventiva. Saggi e dialoghi*. Milano: Mimesis.
- Bonfantini, M.A., Proni, G., 1980. To Guess or Not To Guess? *Scienze umane*, 6, 249–265. English translation in Eco and Sebeok (1988([1983])).
- Club Psòmega, 1986. *La forma dell'inventiva*. Milano: Unicopli.
- Duncker, K., 1945. On problem-solving. *Psychological Monographs*, 58(5), i–113, available at: < <https://doi.org/10.1037/h0093599> >.
- Dunne, A., Raby, F., 2007. Critical Design FAQ. *Personal website*, available at: < <http://www.dunneandraby.co.uk/content/bydandr/13/0> >.
- Dunne, A., Raby, F., 2013. *Speculative everything: design, fiction, and social dreaming*. Cambridge, Massachusetts, London: The MIT Press.
- Dunne, A., Raby, F., 2021. *Design noir: the secret life of electronic objects*. London-New York: Bloomsbury Visual Arts.
- Eco, U., Sebeok, T.A. (Eds.), 1988. *The sign of three. Dupin, Holmes, Peirce*. Milton Keynes: Lightning Source. [First Italian edition: Il segno dei tre. Holmes, Dupin, Peirce. Milan: Bompiani, 1983].
- Johnson, S., 2011. *Where Good Ideas Come From: the Natural History of Innovation*. Penguin Group US.
- Kauffman, S.A., 2000. *Investigations*. New York: Oxford University Press.
- Köhler, W., 1917. *Intelligenzprüfungen an Menschenaffen*. Berlin: Springer.
- Magnani, L., 2001. *Abduction, reason, and science. Processes of discovery and explanation*. New York: Kluwer Academic/Plenum Publishers.
- Magnani, L., 2017. *The abductive structure of scientific creativity*. New York, NY: Springer Berlin Heidelberg.
- Malpass, M., 2017. *Critical design in context: history, theory, and practices*. London-New York: Bloomsbury Academic.
- Marchesini, R., 2014. *Epifania animale. Uguali ma diversi: l'oltreuomo come rivelazione*. Milano: Mimesis.
- New York Times, 2018. < <https://www.nytimes.com/2018/07/11/obituaries/bette-nesmith-graham-overlooked.html> > (online 30 March 2022).
- Paolucci, C., 2021b. Che cos'è una semiotica cognitiva? *Sistemi intelligenti*, 2, 281–303, available at: < Doi: 10.1422/101192 >.
- Paolucci, C. (Ed.), 2021a. *Cognitive semiotics. Integrating signs, minds, meaning and cognition*. Cham: Springer.
- Park, W., 2017. *Abduction in Context. The Conjectural Dynamics of Scientific Reasoning*. Cham: Springer.
- Peirce, C.S., 1931–1958. *Collected Papers of Charles Sanders Peirce*. In Hartshorne, C., Weiss, P. (Eds.), Vols. i–vi, 1931–1935; Burks, A.W. (Ed.), Vols. vii–viii, 1958. Cambridge, Mass.: Harvard University Press.
- Pisanty, V., 1998. *L'irritante questione delle camere a gas. Logica del negazionismo*. Milano: Bompiani.
- Pisanty, V., 2012. *Abusi di memoria. Negare, banalizzare, sacralizzare la Shoah*. Milano: Bruno Mondadori.
- Proni, G., 2017. *La semiotica di Charles S. Peirce. Il sistema e l'evoluzione*. Ariccia (RM): Aracne.
- Shahar, G., 2011. Projectuality versus eventuality: Sullivan, the (ambivalent) intentionalist. *Journal of Psychotherapy Integration*, 21(2), 211–220, available at: < <https://doi.org/10.1037/a0022909> >.
- Treccani, < <http://www.treccani.it/vocabolario/progettualita/> >.
- Walton, D.N., 2004. *Abductive reasoning*. Tuscaloosa, Ala.: University of Alabama Press.
- Zingale, S., 2012. *Interpretazione e progetto. Semiotica dell'inventiva*. Milano: FrancoAngeli.
- Zingale, S. (Ed.), 2022. *Design e alterità: Comprendere l'Altro, pensare il Possibile*. Milano: FrancoAngeli. < <https://series.francoangeli.it/index.php/oa/catalog/book/825> >.

BIO

Salvatore Zingale is Associate professor and teaches Semiotics at the School of Design of the Politecnico di Milano. Among his publications: Interpretazione e progetto (2012), on abduction and inventive processes in the design activity; Design e alterità. Conoscere l'altro, pensare il possibile (ed., 2022), which investigates the presence of the Other in different fields of design.