Possibility, Imagination and Conception

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Sur la mer des possibles flotte mon imagination
qui, je le conçois, ne peut me servir de boussole
Baron de Chambourcy

Abstract

In this paper we investigate the relations between possibility, imagination and conception. We develop a theory according to which these three notions are compatible but independent. This means in particular that none of these notions reduces to another one and that there are things which are: (1) imaginable but neither possible nor conceivable; (2) conceivable but neither possible nor imaginable; (3) possible but neither imaginable nor conceivable. We first explain our methodology: structuralism, equilibrium between norm and description, prototypical examples. And then we proceed.

Keywords
Possibility, Imagination, Conception, Omelet, Eiffel tower, Flying Pigs, Chiligon, Quanton, Contradiction, Imaginary numbers, Tree, World, Life, Death.

0. Position and Methodology

The aim of this paper is to study the relation between three notions: possibility, imagination and conception.[1] We develop a theory according to which these three notions are compatible but independent. A picture is worth a thousand words and this can be described using a simple Venn diagram:[2]

We don't believe that these notions have an inner nature. Our methodology has three main aspects: relational /structural, equilibrium between norm and description and prototypical examples.

Our first methodological option is a *relational / structural perspective*.[3] The idea is that a notion can be understood relating it to other notions. In this perspective, it is important to make a good choice, to choose the right package. The PIC trinity possibility-imagination-conception is somewhat in the air.[4]

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[1] We use "conception" rather than "conceivability", because the latter can be understood as "what it is possible to conceive", involving the notion of possibility.

[2] In this paper we will use diagrams and images. This makes sense because our paper is about imagination. This is also part of a project we are developing; the promotion of the use of images in philosophy, including the creation of a new journal, *The World Journal of Pictorial Philosophy*. Our present word is dominated by images (advertisements in the street, TV and more and more screens), however philosophers rarely make use of images even at conferences (some philosophers are still reading papers). This can maybe traced back to Plato's rejection of appearances.

[3] We could simply say: a structuralist approach, but this is a kind of overloaded word. Nice if our line of investigation is associated with Saussure, Bourbaki, Lévi-Strauss; however this can be too vague or ambiguous. "Relational" is an epithet connected with one of the four meanings of "logos" (science, language, reasoning, relation). Considering this semantic network, we can link "relational approach" to "rational approach" and "logical approach".

[4] About how we started this investigation, see the acknowledgment section at the end of this paper. A book with the title *Conceivability and Possibility* was edited by T.S.Gendler and J.Hawthorne in 2002. An item entitled *Conceivability, Imagination and Possibility* by Anand Vaidya is on-line since a couple of years at *Philpapers* but the author has up to now not

Possibility can also be understood in relation with necessity, virtuality, probability, etc. These are other clusters, complementary rather than concurrent, that can be studied separately in parallel. It is not necessarily a good choice to start with too many notions. There are also other structures, for example the square of opposition and its variations.[5]

Our second methodological option is to find a good equilibrium between a normative and a descriptive approach. For example we don't want to say that imagination is all that has been labelled under this word. Such a descriptive approach would be much confused, and it is probably impossible to find a good characterization of imagination encompassing all what has been called "imagination". On the other hand we don't want to be too normative claiming that imagination is something that has nothing to do with what has been called "imagination", in this case it would be better to use another word.[6]

According to the above Venn diagram there are 7 situations, we will focus on the three exclusive primary cases: pure imagination (green), pure conception (red), pure possibility (blue), but also we will discuss to the three secondary cases: things which are imaginable and conceivable but not possible (yellow), things which are possible and conceivable but not imaginable (magenta), things which are possible and imaginable but not conceivable (cyan).[7] Instead of giving many examples we will try to exhibit prototypes.

We think that *prototypical example* is a good methodology for the development of conceptual analysis. It fosters an approach that can be qualified as *comprehensive*, giving understanding of a concept through a

written any paper or book with such a title, only an article entitled "The epistemology of modality" (Vaidya, 2007, 2015) to which the above item is linked.

[5] For an approach of possibility using other packages and the square see our recent papers: "Le possible et l'impossible: au-delà de la dichotomie ?" (2016), "What is the right position of possibility in the hexagon ?" (2016).

[6] Before Alice starts to criticize the views of possibility, imagination and conception presented whose configuration is summarized in our PIC Venn's diagram, it would be good for her to re-read three times this paragraph: the present version with *imagination*, the version with *conception* and the version with *possibility*. As it is known from the *Hunting of the Snark*: three leads to truth. And playing with words is playing with fire, so if Alice doesn't want her mind to be set on fire, she has to take seriously what we are talking about, words being a slippery surface.

[7] The diagram we are using is a classical Venn diagram representing the relations between primary and secondary colors. For an approach of the theory of colors based on the hexagon of opposition, see the 2012 paper by Dany Jaspers "Logic and Colour". The choice of the specific correspondence between PIC and RBG (P=B ; I=G : R=C) is ours, it is related to the connection we have established between RBG and the three notions of opposition of the square, see our papers "The new rising of the square of opposition" (2012) and "The power of the hexagon" (2012).

concrete example able to catch unity beyond multiplicity and variety.[8] This threefold methodology aims at *conceptual clarification* – cf. the title of our recent tribute book to Patrick Suppes (2015) and the 1944 paper by Tarski on truth ("we should try to make these concepts as clear as possible" says Alfred to us).

Let us start with a first prototype, characterizing the 7th slice of our Venn diagram, the white one at the middle, corresponding to things which are at the same time possible, conceivable and imaginable. Our prototype here is an omelet:

This is something you can easily imagine (see the above picture), conceive (have a look at a recipe) and possible (start cooking!).

After this delicious *mise en bouche*, let us proceed to the main course …

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[8] For more details about this approach, see our forthcoming paper "Prototypical conceptual analysis". This methodology is connected with symbolization; see our 2014 paper "La puissance du symbole".

1. Imagination

We understand imagination here in direct relation with images, in particular *material images*: a painting, a drawing, a photograph, a reflection in a mirror or in the water, a movie. A material image can be a representation of a concrete reality or of an abstract reality. Compare the two following images:
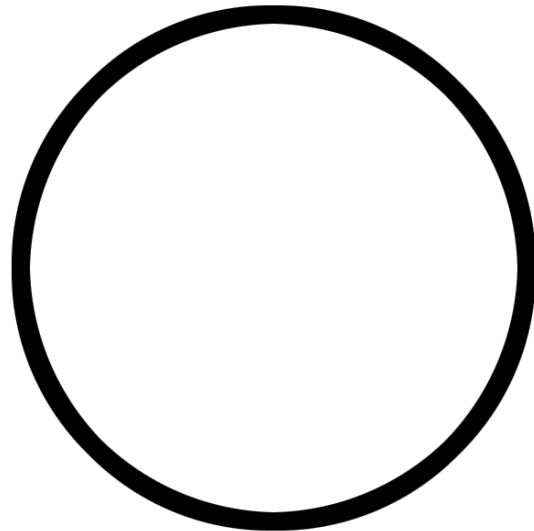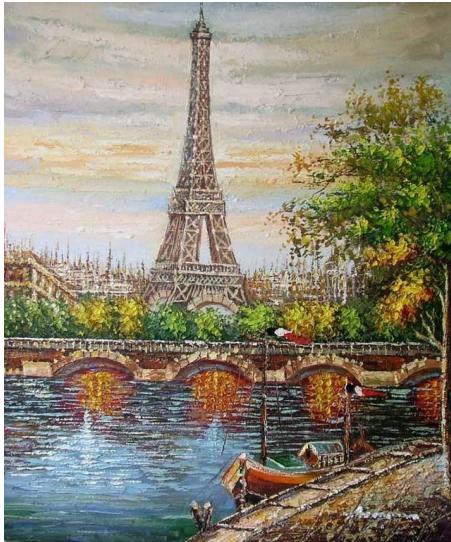

The image of a *circle* can be considered as a materialization of an abstract idea: a line that is curved so that its ends meet and every point on the line is the same distance from the center. On the other hand this idea can be seen as an idealization of concrete realities:

However this is not the same as an image describing a specific object like the above painting of the Eiffel tower.

Images can be used to create a concrete reality, for example images of the Eiffel tower were produced before its construction:
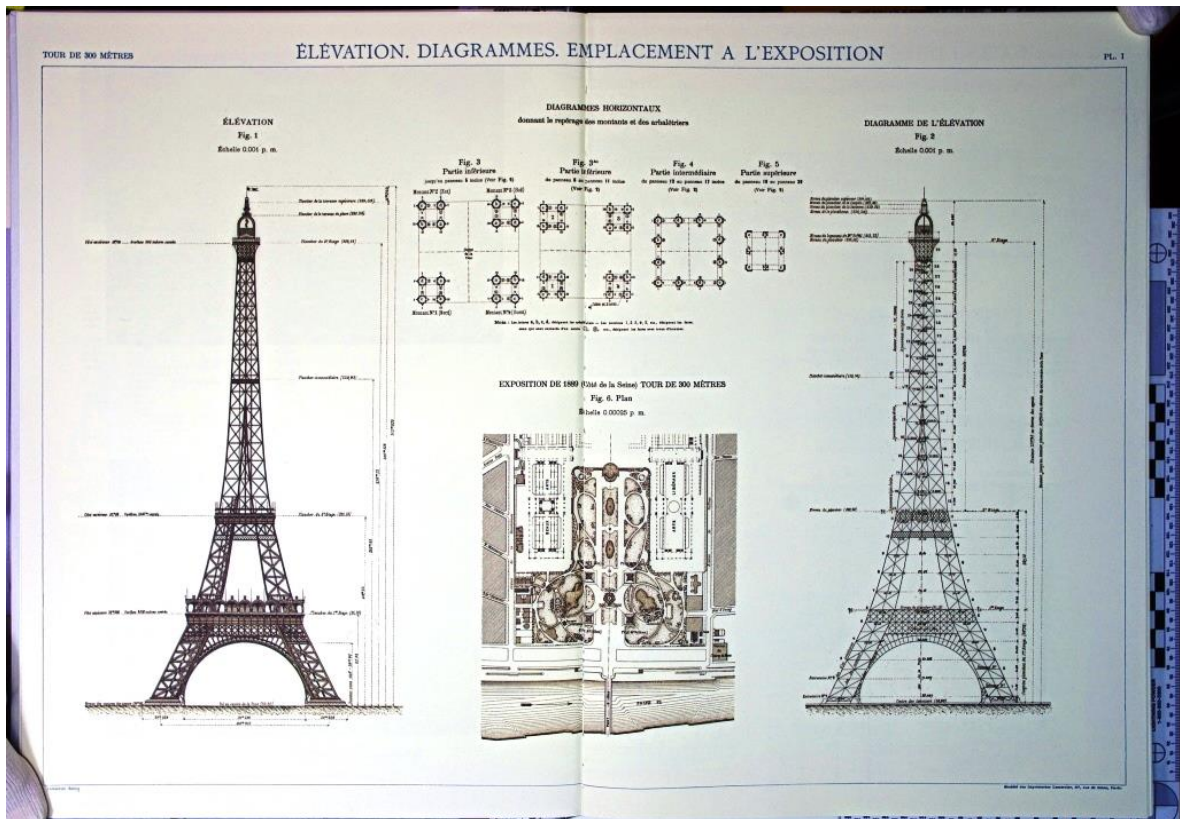
But many images do not correspond to real objects, entities or events, like the image of a centaur, a smurf or some images produced by special effects:


It is easy to create images of impossible things. This was done quite a lot at the beginning of the history of the cinema, in particular by Georges Méliès (1861-1938). One of his most famous movies is *A trip to the moon* (*Le voyage dans la lune,* 1902).

Le Voyage dans la Lune. (Le Clair de Terre) 10e Tableau
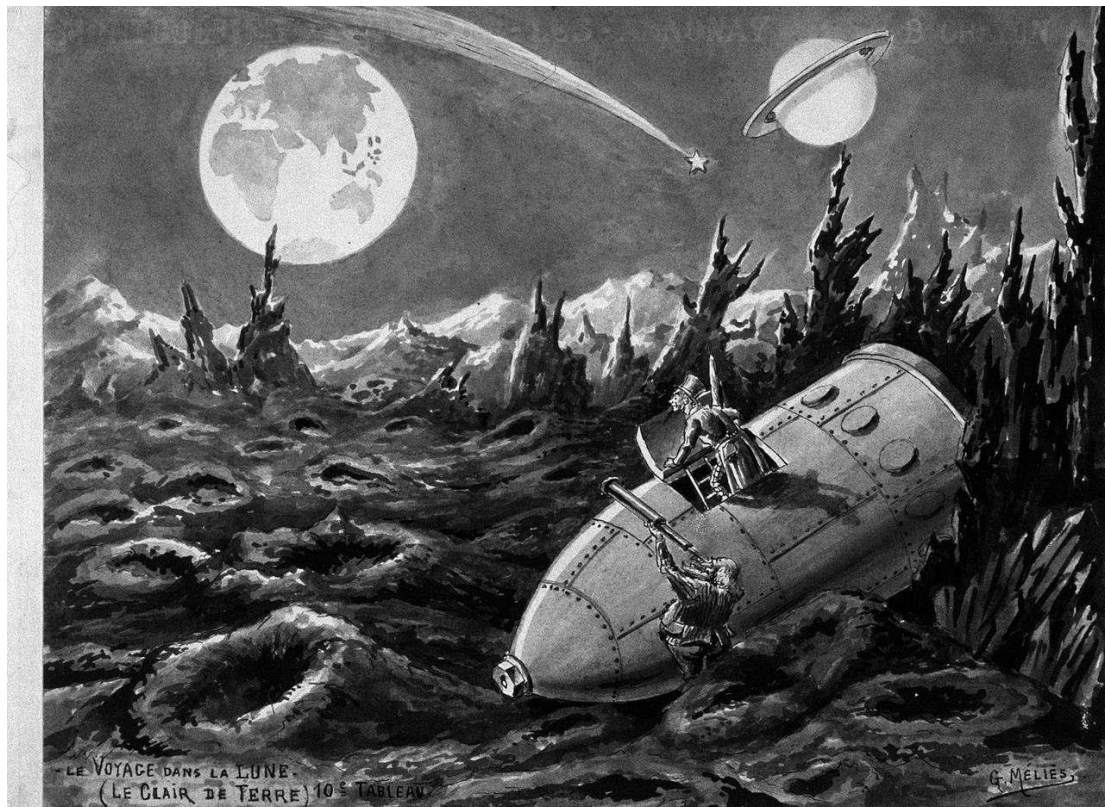
At this time it was not possible for human beings to go to the moon. After 1969 we can say it is not only imaginable but also possible (although some people are arguing that these moon images are due to Stanley Kubrick, famous for producing and directing *2001: A space odyssey* in 1968).
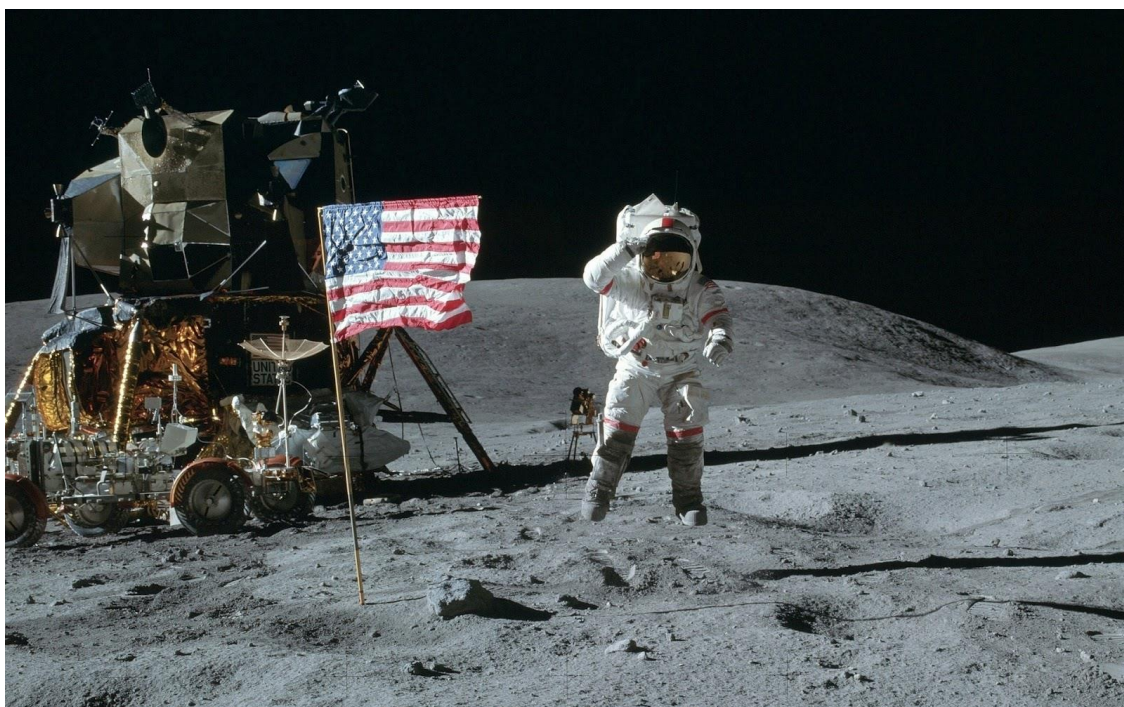
Going to the moon is conceivable in the sense that we have a theory explaining how we can do that. Travelling to Mars is also conceivable. However there may be many disparities between imagination and conception. On the one hand a movie about a trip to Mars can be produced with lots of special effects which do not correspond to the theory explaining "step by step" how to go there. A prototype of something which is imaginable and conceivable is the above plan of the Eiffel tower.

A travel out of the solar system is something we can imagine but not conceive, we have no theory at this stage explaining how to do it. And this is presently not possible. But something can be possible even if we cannot conceive it, we will be back to this on Section 3. And also it not because something is conceivable, that it is possible, we will talk about that in Section 2. Anyway without going out of the solar system and/or travelling in time, we can give a simple example of something which is imaginable but neither conceivable nor possible: a flying pig, like *Adynaton* represented in the below picture.
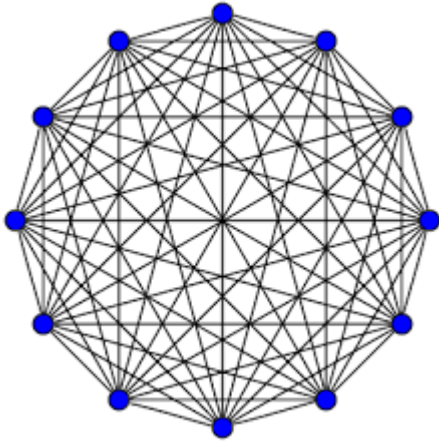

But with the advances of science, this flying pig may be one day conceivable. This would be a giant leap for mankind.

2. Conception

It easy to find things which are conceivable but not imaginable, a typical example is the famous chiliagon of Descartes. A *chiliagon* is a polygon with 1.000 sides.

The above left picture is NOT a chiliagon, it is a dodecagon. It not easy for us not only to concretely draw a chiliagon on a piece of paper (however this is not technically impossible) but it is clear that we cannot have a mental image of it just closing our eyes. Note also that one can argue that the above picture is not Descartes, but just an approximation of his face.

Our brain cannot imagine what a chiliagon is but a computer can do it, in the sense that it can construct quite easily and quickly an image of a chiliagon.[9] Does this mean that computers are imaginative? Maybe not so much. Can a computer imagine what aleph zero is, or, more simply, what the empty set is? It can at least produce the two beautiful symbols for them:

$$\aleph_0 \qquad \varnothing$$

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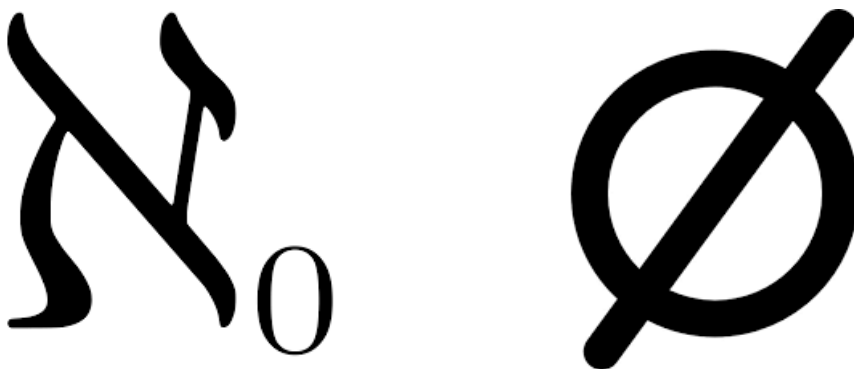
[9] About the brain and mental images see our joint paper with Suppes (2004) and correlated works published by Suppes Brain Lab.

It is also not clear at all that human beings can imagine aleph zero and the empty set. These can be considered as purely conceptual objects like many mathematical objects, including *imaginary numbers*. Do we have an image of an imaginary number?
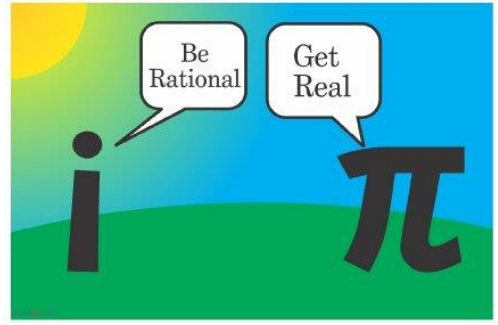
Real numbers, although very abstract, can be call real because they are in connections with reality; they are used to described, understand, modify reality. But are imaginary numbers in connection with imagination? One of the possible origins of this terminology is the association between creativity and imagination. Such an association can be considered also as backing expressions such as *Imaginary geometry* and *Imaginary logic*, both being in fact against imagination as an images driven faculty. Imaginary geometry, also called *Non-Euclidean geometry*, is geometry rejecting the parallel postulate. It was developed in particular by Nikolai Lobachevsky (1792-1852). Nicolai Vasiliev (1880-1940), also from Kazan, inspired by the former developed a logic rejecting the principle of non-contradiction he called by analogy *Non-Aristotelian logic* or *Imaginary logic*.[10] In both cases these are theories more abstract than the basic ones and not based or motived by some images.

Reducing creativity to imagination is not a very sophisticated idea. Creating images (real or mental) can be seen as the easiest form of creation. This is something that every human can do, not something we need to dream of. Mathematics and music are in fact good examples of strongly creative activities not necessarily based on or connected with images.

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[10] For this reason Vasiliev is generally considered as the forerunner of paraconsistent logic which was later on developed by Stanislaw Jaśkowski (1906-1965) and systematically by Newton da Costa (1929-). About the work of Vasiliev, see the IEP entry by Bazhanov (2016), our paper "Is modern logic non-Aristotelian?" and other papers in the book edited by D.Zaitsev following the congress organized in honor of Vasiliev in Moscow in 2012 , as well as the recent paper by Maximov (2016).

We may have images of strange mathematical objects like Möbius strip (something easier to imagine than to conceive):

But mathematical objects like transfinite numbers are typically things which are conceivable but difficult to imagine, even if the proof that the real numbers are not denumerable can be "seen" by a diagonal proof:[11]

```
Natural      Real
   0      0.236436775676...
   1      0.098473294543...
   2      0.193214042202...
   3      0.843279242093...
   4      0.012934812343...
   5      0.639423412934...
   6      0.017773923845...
   7      0.238920090909...
   8      0.123984732999...
   9      0.646329878122...
  10      0.000123943437...
  11      0.981298312892...
   .          .
   .          .
   .          .
         _____
          0.293233992132...
          0.746894310875...
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Now can we say that $\aleph_0$ or his transfinite sisters are possible? Possibility can here be connected with consistency / non-contradiction. As we know, there are no absolute proof of the existence of transfinite numbers or even natural numbers, in the sense that there are no absolute proof of the consistency of arithmetic and set theory. On the other hand some mathematical objects are typically not possible in the sense that they are contradictory, for example a curved straight line. And these kinds of objects are

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[11] About visual proofs see the two volume book by Nelsen (1997-200) and the book by Shin and Moktefi (2013).

also not product of imagination. For example the image below is not an image of a curved straight line:

    A curved straight line can be seen as a prototypical contradictory object, *contradiction* being itself a prototype of something that is conceivable but neither possible nor imaginable. A contradiction is conceivable; in particular we can define it, either in the framework of the square of opposition or propositional modern logic:
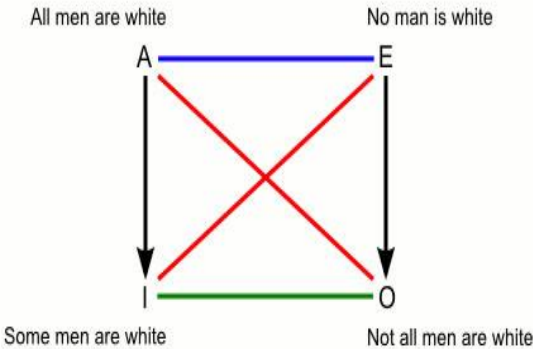

p	¬p
0	1
1	0

    On the right we have the truth-table for classical negation saying that p and ¬p form a contradiction, because they can neither be true together nor false together (true being represented by 1 and falsity by 0) . This is the definition of

classical negation, directly related with the notion of contradiction of traditional logic that can be found on the theory of the square of opposition.[12]

On the left the square of opposition defines two *contradictory* propositions as two propositions that can be neither true nor false together, the contradictory relation is represented in red in the above picture. In blue we have the relation of contrariety: two propositions are *contrary* if and only if they can be false together but not true together. An example of contrary object is a round square, because the two propositions "*x* is a square" and "*x* is a circle" cannot be true together but can be false together, for example *x* can be neither a square nor a circle, it can be a triangle. The fact that frequently people give as a typical example of contradictory object a round square shows that there is a tendency to confuse the notions of contradiction and contrariety.[13]

Anyway a contrary object like a round square is also something that can be conceived but which is neither possible nor imaginable, unless we have a weak logic of imagination according to which if we imagine A and we Imagine B therefore we imagine the conjunction of both, in symbols: $\circ A \wedge \circ B \rightarrow \circ(A \wedge B)$. This is imagination by juxtaposition as represented by the following simple round square and a round square haircut (better tangled):
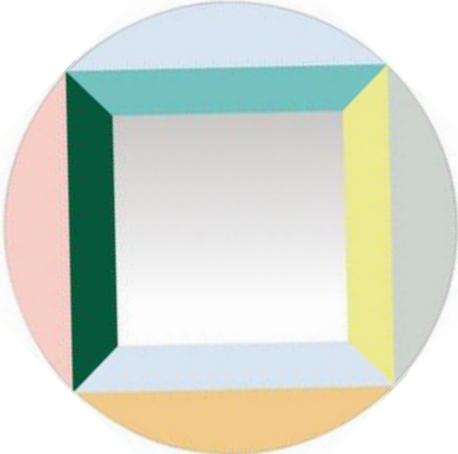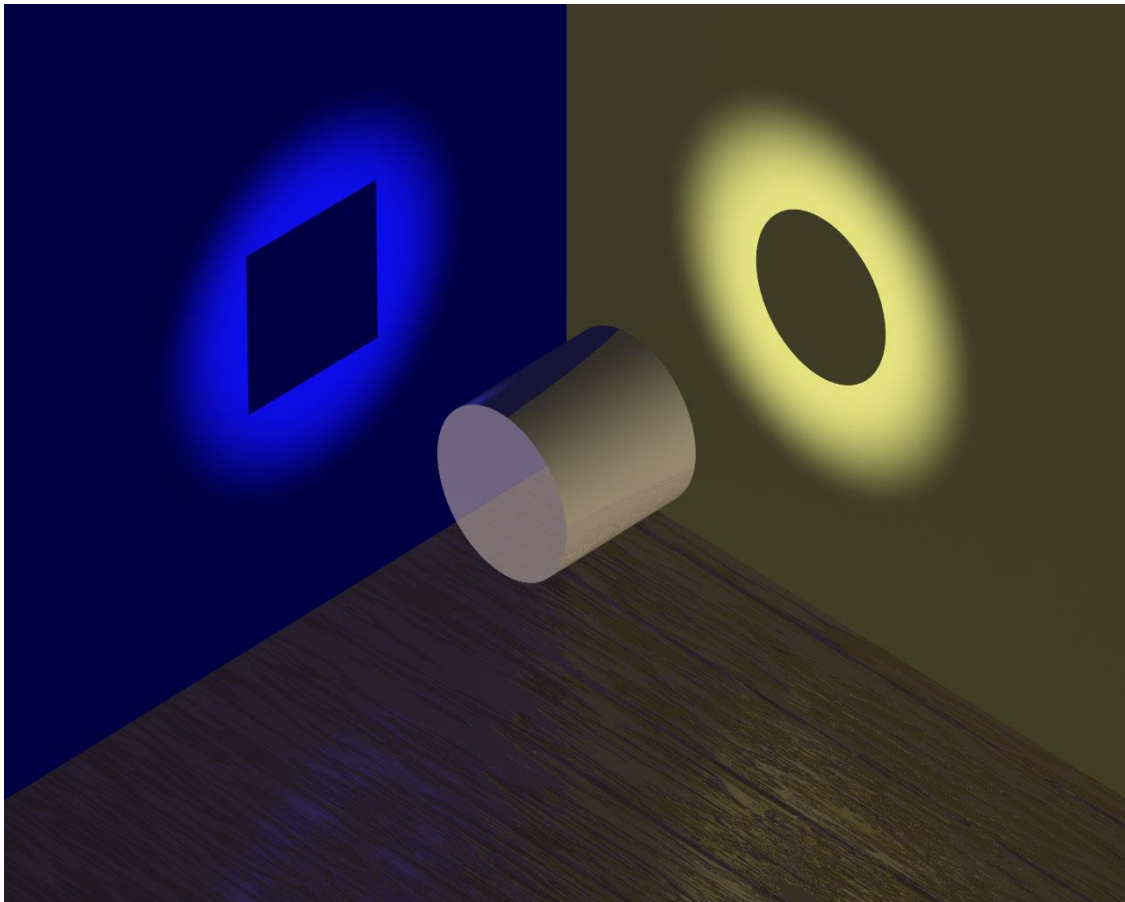
Let us now have a look at the following picture which has been used by physicists to metaphorically represent the wave/ particle duality:


According to this picture something may *appear* as a square and as a circle. But a cylinder is indeed neither a square nor a circle. Following this metaphor an object can appear as a wave, or a particle, but is neither a wave nor a particle. But then what is it? We have presently no way to *imagine* it. J.-M.Lévy-Leblond and F.Balibar have introduced the word *quanton* to talk about the objects of quantum physics, but it is still quite fashionable to talk about elementary particles, in particular in literary circles. Although physical theories can give us a good account of microscopic reality, in particular in terms of prediction, we have no clear image of it, a miscroscope in particular does not provide corresponding images.

We can consider quantons as prototype of magentaic objects, those objects which are in the magenta zone of our Venn's diagram. We can conceive this kind of objects and they are possible, but we cannot imagine them. Different interesting philosophical approaches to modern physics have been defended by people like Bernard d'Espagnat (1921-2015) or David Bohm (1917-1992), a

former collaborator of Einstein, both of whom I have been working with (see my 1987 dissertation).

Albert Einstein himself is famous for the following quotation:
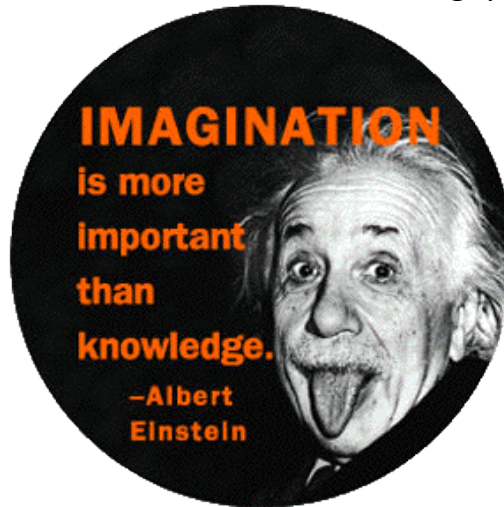
The continuation of the quotation is: "For knowledge is limited to all we know and understand, while imagination embraces the entire world, and all there ever will be to know and understand." According to this vision, imagination is a super faculty of our mind. It is not clear which kind of power it is. Here again it seems that imagination is associated with something like creativity and is not directly based on images. As we have said we can conceive microscopic reality even if we don't have images of it. We can say the same about macroscopic reality. The theory of relativity is based on non-Euclidean geometry, something hard to imagine, which does not properly match with the images given by telescopes.

Another quotation about imagination attributed to Einstein is: "Logic will get you from A to B. Imagination will get you everywhere." Here also it is not clear what is this magic faculty called imagination. These quotations have been largely promoted and give an ambiguous idea of science, Einstein being considered as one of the most famous scientists. People without much capacity of reasoning may feel like scientists of genius imagining absurdities.

There are many things we can understand that we have no images of. It is therefore misleading to say they are products of our imagination. Someone could claim in a neo-Platonic fashion that reality is beyond imagination; that it can only be reached by the eyes of reason. And logic (reasoning) has get us to some places we were not even able to dream of, for example in front of a HDTV, drinking coca-cola and closely watching tigers without the risk of being eaten.

 On the other hand images can be used in many different interesting ways, in particular in a negative way as Plato did with the image of the cave, or metaphorically as with the above cylinder picture.

3. Possibility

Everything is possible. This can be understood in two different ways, a vulgar mode and a more sophisticated one. The vulgar one has been used by people like Sarkozy who with a popular futurist variation of this magic sentence was elected president of France in 2007:


The more sophisticated mode is that possibility is a modality which applies, successfully or not, to everything: actions, events, ideas, theories, beings. It is a kind of universal operator: given X, we can talk about possible X. In modal logic, possibility is represented by the sign "◊", poetically called a diamond. But in this context, possibility generally applies only to propositions. Let us emphasize that possibility in modal logic is only one possible aspects of possibility.

Possibility applies to imagination and conception. Conceivable is what it is possible to conceive and imaginable what it is possible to imagine. By contrast to imagination and conception, possibility is not restricted to a faculty. It is also ontological. What is the exact relation between possibility and reality? We can reasonably say that reality is possible; in particular what happens is possible. But possibility is larger than reality. Many things that are possible are not necessarily happening.

In previous sections we have seen examples of things of imagination and conception which are not possible. We will now see examples of things which are possible but which are neither conceivable nor imaginable. First let us start with something easier, the realm of the cyanic things, those who are both possible and imaginable, but not conceivable. A simple example is a tree:

This tree is possible and imaginable. Now can we really conceive it? Do we have a theory explaining exactly what this tree is? A botanist may say yes. But Sartre facing the *Nausée* may say no. Biology is a science which typically has developed through classification and one of the keys of classification is the tree structure, [14] easier to imagine that a real tree, but giving us only a partial vision of the essence of the tree:
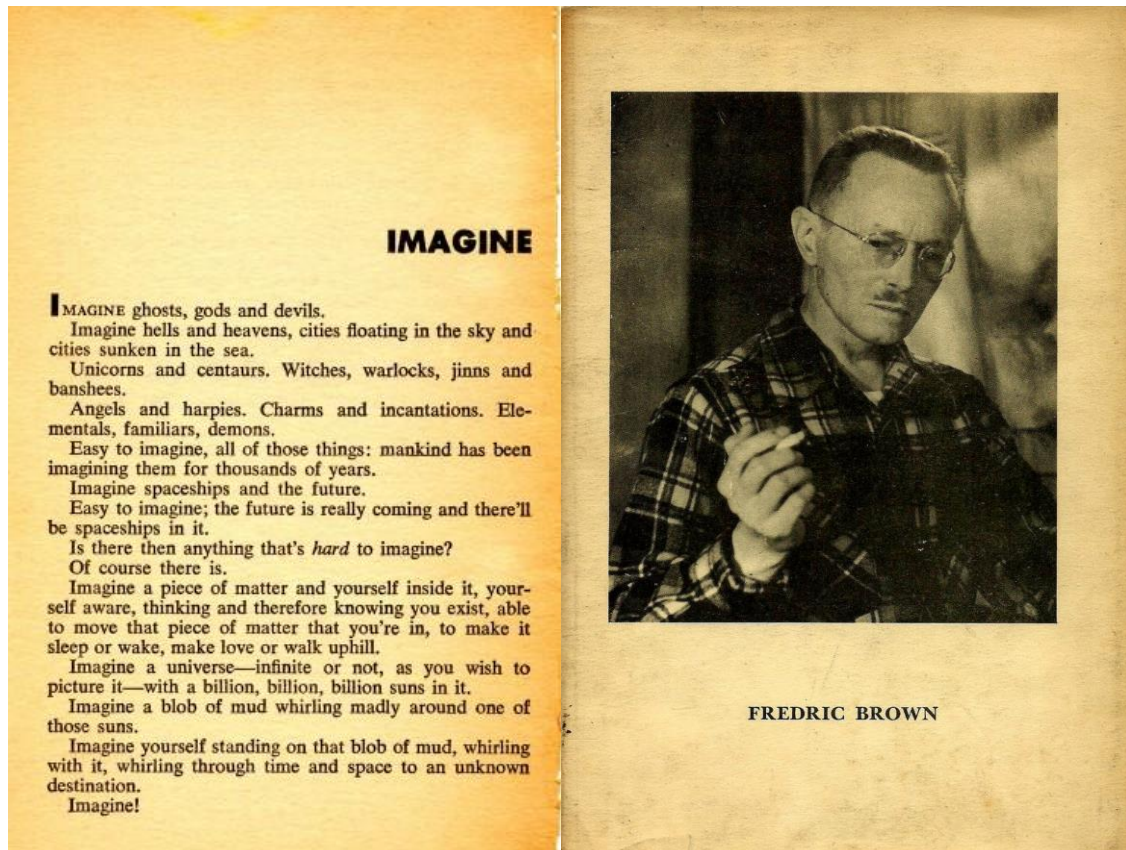

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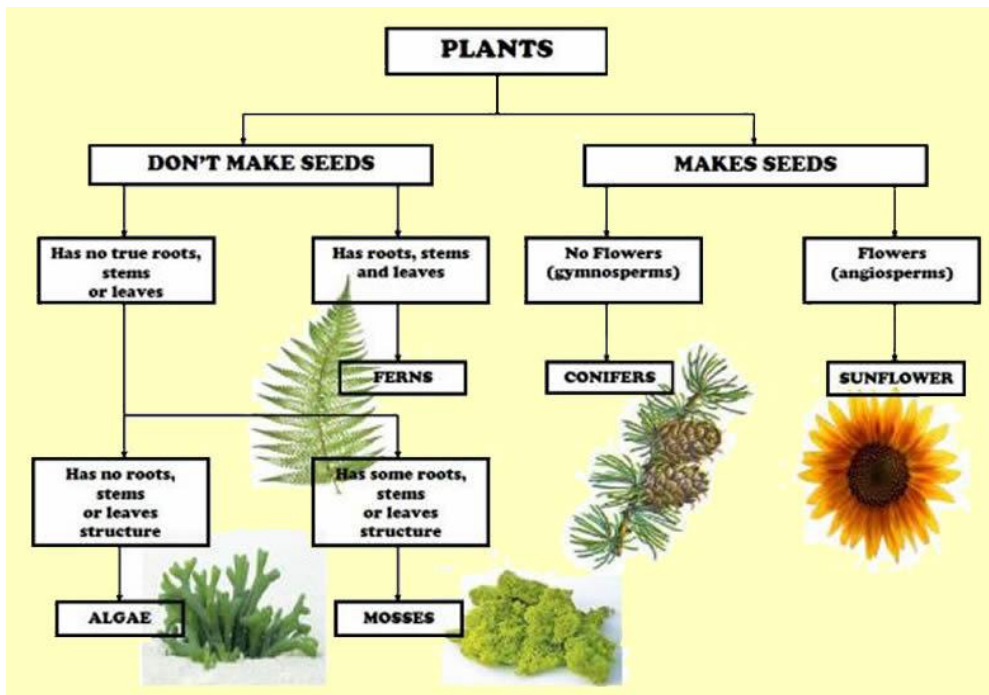
[14] On the theory of classification, see the recent book of Parrochia and Neuville (2012).

Now let us go further on, when imagination lets us down. We can produce a picture, a painting, a mental image of a tree. But can we do the same about the whole reality in which this tree is merged in?

Let us start with a short story by Fredric Brown written in 1955 called *Imagine*:

IMAGINE

IMAGINE ghosts, gods and devils.

Imagine hells and heavens, cities floating in the sky and cities sunken in the sea.

Unicorns and centaurs. Witches, warlocks, jinns and banshees.

Angels and harpies. Charms and incantations. Elementals, familiars, demons.

Easy to imagine, all of those things: mankind has been imagining them for thousands of years.

Imagine spaceships and the future.

Easy to imagine; the future is really coming and there'll be spaceships in it.

Is there then anything that's *hard* to imagine?

Of course there is.

Imagine a piece of matter and yourself inside it, yourself aware, thinking and therefore knowing you exist, able to move that piece of matter that you're in, to make it sleep or wake, make love or walk uphill.

Imagine a universe—infinite or not, as you wish to picture it—with a billion, billion, billion suns in it.

Imagine a blob of mud whirling madly around one of those suns.

Imagine yourself standing on that blob of mud, whirling with it, whirling through time and space to an unknown destination.

Imagine!

FREDRIC BROWN

Fredric Brown (1906-1972) was an American writer, authors of several novels, both mysteries (e.g. *One for the road*), science fiction (e.g. *What mad universe*), but he is considered as a master of short stories in particular of *short short stories*, sometimes also called *flash fictions*. Can we however call the above text a fiction, a story? A story of what? In the end nothing happens! What is interesting about this text is that Brown, a champion of imagination, points out that reality is more incredible or absurd than anything we can imagine.

Can we imagine the *world*? Possible worlds have become quite popular recently but what about the real world? Here is a possible image of it:

Maybe in the future this image will appear as absurd as the following picture of pseudo-Indian mythology:

In fact the above modern image is already absurd in the sense that it is centered on the earth, as if reality reduced to that "blob of mud".

A more general image would be an image of the *universe*:

But such an image reflects only one aspects of reality. It does not give an account of the sense of life. The same can be said about the conception of the universe given by physical theories. That is why we can say that reality is not conceivable. *Sense of life* is an ambiguous expression; some people prefer to talk in a more pataphysical way.

"Life" can be used to talk about reality or a particular phenomenon part of it, life in a biological sense. Despite the development of biology, we can say that life in a biological sense is still a mystery, whose conceptualization is still pretty immaculate. And what kind of generic image can we have of life encompassing entities as varied as cats, trees, human beings and the surrounding mystery? Here is one given by Lewis Carroll:
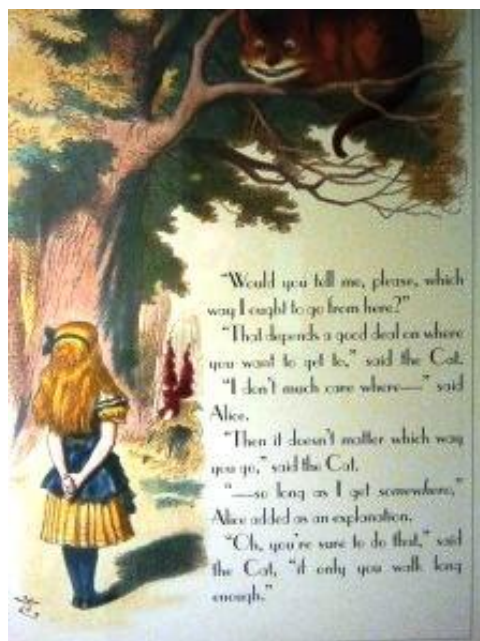
But this is a very metaphorical image of life. If you don't know where you are going, any road will get you there: this is roughly speaking the message of the cat. Anyway all paths lead to death, something which is also neither easy to conceive nor to imagine. Here is a symbolic image of Death:

DEATH

Such an image is surely limited. It does not picture death in all its aspects. We can say that its metaphorical representative power is less than the one of a dodecagon to represent a chiliagon. From a dodecagon we can imagine what a chiliagon is, the euphemism being purely quantitative and quite straightforward. And the difference is that not only it is difficult to imagine death, but also difficult to conceive it. A biological view of death is only partial and does not really explain what death is. Can we conceive what we will be when we will die?
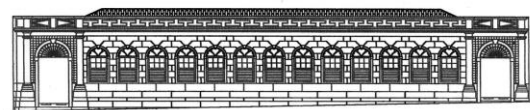
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Acknowledgments

ACADEMIA BRASILEIRA DE FILOSOFIA
Ad Veritatem

Glória, Rio de Janeiro, December 8, 2015

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[15] At this occasion I presented, as the director of international relations of the Brazilian Academy of Philosophy (ABF), the candidacy of Rio de Janeiro for the next edition of the WCP (World Congress of Philosophy) projected to happen in 2018, with *Imagination* as the main topic. Brazil lost against China, so the 24th WCP will happen in Beijing in 2018 with *Learning to be human* as the main topic. It is conceivable and possible to have the next next WCP in Rio de Janeiro in 2023 on *Imagination;* we have received support in this sense.