ANNEX

Laurent Dubois

ANNEX I : Abusive use of the implication

In order to display the specificities of "validity" & "truth checking" notions, let's come back to one of the flaws of the demonstration, the abusive use of the implication.

Let us focus on a specific sentence of the demonstration, whom the truncated character of the interpretation of the formulation can in no way be ascribed to the author of the demonstration.

If the sentence "absolute truth does not exist" had to be "absolutely" true, we would simply have a variant of an autocontradictory assertion like "This sentence is false", what I call an "oscillatory" assertion, like Richards & B. Russell paradoxes ; but if this hypothesis is simply true, it is abusive to consider it contradictory, in the same way it is to qualify the assertion, by Epimenid the Cretan : "All the Cretans are liars", paradoxical !

If the sentence "absolute truth does not exist" is false, the sentence "Absolute truth exists" MUST be true by definition, and we have, as I said, a tautology, or rather a testimony of the consistence of the demonstration, but not the proof of its adequacy to the reality.

This pseudo-demonstration is exemplative of an abusive identification/projection/assimilation of the "real" existence to the object of the sentence ; predicate (meaning)/effective existence.

Plus, as we have seen, if "absolute" implies de facto existence, no demonstration is necessary.

But what does one mean by truth ?

In logic, distinction between "validity", with/through truth tables, and truth "per se" according to the adequacy meaning/object of the meaning

We have to make the distinction between the meaning of a sentence and its object ; let's consider the following assertions :

- this is a sentence

- this is a planet

- this is a theory

- this is a joke

- this is a wink

- this is a hole

- this is false

- this is true

- this is absolutely true

- this is a sentence   (true)

- this is a planet   (false)

- this is a theory   (false but one could easily find someone to try to prove it's true!)

- this is a joke   (relative to the sense of humour of the reader)

- this is a wink   (kinaesthetically false, semantically true according to the context)

- this is a hole   (false, unless it could be considered a hole in the nothingness!)

- this is false   (undecidable)

- this is true   (true)

- this is absolutely true (wrong according to our definition of "absolute" : indeed, it's not independent of any condition since relative to its transcription on this page ; it's not "always" nor "everywhere", in nay case, we cannot check it ; if "always & everywhere" make sense, the process of checking would be infinite; if not, "absolute" doesn't make sense either ! True per se ? But then, in the same way as any form of being is. At best, it's abstractly meaningful because of the impossibility to really define "absolute", as we will see or as we have seen according to the order in which you read this article).

Let's consider now :

- this sentence exists

- this sentence doesn't exist

- there exists a sentence that can assess that it exists

- there exists a sentence that can assess that it doesn't exist.

Finally :

- This sentence is true   (true ; as we will see below, we would have to say that, according to our definition of "sentence" & our framework, it "seems" that this is a sentence and that it has to be true !)

- This sentence is not true   (oscillatory/undecidable)

- This sentence is absolutely true   (false!)

- This sentence is not absolutely true   (true)

So we have the proof that the predicate "absolute" adds info to the sentence.

Now, let's come back to : "absolute truth exists" and "absolute truth does not exist"

The sentence "this sentence exists" is its own proof, hence, it's true, but this is patently not an absolute proof/truth since relative to its formulation !

So, for the sceptical, we have made the demonstration that there exist truths that are not absolute, but that can be true "per se".

A contrario, the sentence "Absolute truth exists" is not true/obvious per se, it's not its own proof since we have to demonstrate the absurdity or at least the ambivalence, paradoxical/oscillatory nature of the contrary; hence, it's relative to the reductio ad absurdum demonstration ! Though, one would have thought that absolute truth has to be self-evident !

All this is logic because the object of the sentence is not primarily the sentence, it is retroactively only; initially, the object is the notion of "absolute truth". We don't dispose of a tool

for an automatic verification of its adequacy to the reality ; all the less obvious that, in a sense, it is question here of reality itself, and it can not have an absolute point of view on itself !

ANNEX II : Validity-truth specificities illustration

About the Russell-Strawson (& Ockham's spectrum) debate on reference & meaning.

Russell argues that the sentence "The king of France is wise" makes sense despite of the current inexistence of a king in France because it's a "description" to which corresponds a "universal", which is a "concept" abstracted from the observation of particular things, but which exists per se, kind of Platonician ideal forms.

For Ockham, these universals exist in the mind only & are not really "abstract" things, but the "memory" of the abstraction of universal characteristics from particular entities in the spirit of "personal supposition".

One reproachs Russell the confusion between "use" & "mentioning" of the words, making wrong the sentence "The king of France is wise" not because there is really no king of France currently, but because the terms "The king of France" are not the term "wise" ! But I think one made bad, unfounded "interpretation" intentions critics to Russell and that one cannot make this reproach to him. Of course, he would have been more advised to argue that a "universal" is a general characteristic that transcends any particular entity & that probably conditions an individuality in the sense that each individuality is the sum of some universals.

But the analysis of Ockham himself is made from the referential of an individuality, it's a posteriori. It would probably be more correct to take the position, the point of view of the universality, in the same way that Kant did when he defined space & time as a priori conditions of the sensibility.

To come back to Russell, he asserts that the assertion "The king of France is wise", while not referring to anything real, is meaningful because it is a "description" of the kind : "There exists one and only one x such that x is king-of-France and x is wise" & because this description corresponds to "universals". These universals are abstract objects (horseness), concepts.

As for Strawson, he argues that one doesn't need "reference" to anything but agreement on "conventions" (reason why words are never empty noise because they are "conventionally" significant & don't have to mean anything.), reference is secondary; consequently, meaning doesn't depend on true/false (decidability) but on validity ! Operatory language (formalism ? Grammar ? Validity ?). Logically valid, grammatically correct ; but what about translation ?

But of course, meaning exists beyond convention, proof is precisely the possibility of translation from one "conventional" language to another.

In fact, the absence of a king of France currently doesn't make the sentence false but "undecidable". Indeed, we cannot put on the same level the absence of an attribute in an existing entity, and the absence of that entity !

For Russell, universal persists in the mind without any reference to particular entities.

The abusive interpretation of Russell's interpretation theory consists in making him "mentioning" the universals rather than "using" them!

What does one mean by "meaning" ?

In one or another way, there must be a "connection" :

- with something current-present   } demonstration of the non-absolute character, if not of the

- with something past   } "meaning", at least of the "connection.

- with something future   }

      This is why we have different conjugations.

      In addition, we have seen that a sentence can be :

- grammatically correct

- consistent (only a set of propositions is consistent)

- logically valid (in fact, only an argument [deduction] is valid/invalid, but an argument is a set of propositions)

- sound (valid argument with true premises)

- abstractly meaningful

- empirically true/concretely meaningful.

      A proposition is a sentence always :

- meaningful

- non-ambiguous

- descriptive

- constituting the (propositional) content of indicative/interrogative/imperative sentences.

      In mathematics, a proposition (theorem of less importance) is always true (it's a logical proposition AND it is true), in mathematical logic, it's decidable.

      The simple use of the word "truth" presupposes its understanding & consequently some kind of correspondence between its signs & "something" that constitutes its meaning!

      Conclusion : the sentence "The king of France is wise" is grammatically correct, logically valid and... "abstractly" meaningful, and, contrary to what Russell thinks, no need of "universals", the sentence evokes the memory of a particular king ; "universals" can play a role but of course, they are a posteriori.

      Now, the sentence is "undecidable" because of the inadequacy conjugation/object; to be decided empirically true or false, the sentence would have to be modified, e.g. "The king of France in 1661 was wise" ;

      Just for fun, let's consider the following sentence : "The king of France in 3661 will be wise" : "abstractly" meaningful, decidable in 3661 only but "retroactively" true or false at this moment ! Indeed, in 3661, to be really true or false "in 3661", the sentence must become : "The king of France in 3661 IS wise" ! In its initial form : "The king of France in 3661 will be wise", the sentence will be true or false before 3661, but retroactively, i.e. decided in 3661. Some patience, please :)

ANNEX III : Intension – Extension

* Intension : sense/connotation

* Extension : reference/denotation

Mr. Jekyll is the closest acquaintance of John Utterson.

Mr. Hyde is the closest acquaintance of John Utterson.

- Extensionally equivalent propositions

- Intensionally distinct propositions.

* Intensional context (oblique or referentially opaque contexts)

John Utterson is admiring Mr. Jekyll

John Utterson is admiring Mr. Hyde.

- not only intensionally different propositions, but one of them is clearly wrong - indeed, John Utterson is clearly not admiring Mr. Hyde- and consequently causes an extensional bias.

* Extensional context (clear or referentially transparent context)

Mr. Jekyll is the main character of the Stevenson's partly homonym novel

Mr. Hyde is the main character of the Stevenson's partly homonym novel.

ANNEX IV : Some Semiotics

Ceci n'est pas "Ceci n'est pas une pipe".

This is not the painting of Magritte, in the same way that the object of the painting of Magritte is not a "real" pipe but a representation of a real pipe.

The representation stays at a meta-level compared to the reality, as words are. The interest of a word use is the possibility to evoke an object/entity in its absence or to invent, to let imagination develop. But a meta-level of what ? It's also reality itself of course.

But is what one names a "pipe" really a pipe ?

Now, who points out, by the absurd, this "referential" nature ?

Rene Magritte. But what is Rene Magritte?

The name of a particular entity & the designation of this entity.

But what's a particular entity ?

It's the description developed by… a particular entity !

A particular entity is what is currently asking "what's a particular entity ?" through signs named "words".

What are signs & words ?

Particular entities produced by particular entities and intended to design particular entities.

A particular entity is "I".

"I" is the most simple & obvious word I can use.

Diving toward the nucleus/kernel & back to the generalization.

Did I elaborate this description?

Not I, but another "I"!

Could this other "I" not be I?

If I generalizes myself only, if I extend the meaning of the "I" that designs myself to a larger I that includesother "I". Then, I am all these "I". (I = L.D. is not my atomical form, living entity only. Atoms, nucleus)

Semantics : what signs mean
syntactics : formal/structural relationship between signs
semiotics : how signs mean
pragmatics: relation of signs to interpreters

[Chomsky: Transformational/generative grammar]

ANNEX V : Truth theories

There is not even a consensus about what "truth" is exactly !

Questions about truth :

1. What does "true" mean?

2. What are the criteria for attaching truth value to truth bearers ?

(excerpt from http://spruce.flint.umich.edu/~simoncu/225/truth.htm)

Preliminary : if the above questions make sense, they are the proof that meaning exist & truth makes sense, at least in a relative sense !

- Correspondence theory : either a connection between language (subjective) & world (objective/noumena), either not.

If not, it's as if the reality didn't exist (now, is the use of the concept of "reality" not already the proof of a connection ?).

At worst, one makes "as if" the connection was possible & one tried to find and express it.

But if it really doesn't exist, pure lost of time !

Now, what is the pertinence of this analysis ? It rests on A2VL, on what it describes. Arbitrary? The seemingly "absolute" side of the things (reality). At least, it's the minimal reality… as long as these lines are read & approved !

Most frequent criticism : "anything could correspond to anything". Thus, truth would be arbitrary. But if terms & their combinations are arbitrary, once the agreement/consensus on meaning, convention on reference are established/accepted, one works in a same framework. Truth is not relative to the arbitrary terms, but to the framework. And the possibility of "translation" of truths into other languages gives them a "pseudo-absolute" character. (// Relativity; Tarski)

In fact, no problem, the (even implicit & translatable) convention functions perfectly; proof: this criticism/doubt about itself itself makes sense. So there is a presupposed/autoconstitutive common ground without which absolutely no relativisation would be possible. Does it mean that this (meta) remark is absolute ? No, it has to be made relative since it comes from itself (true per se !) or from a totally different/undefinable/unperceptible origin, in which case it's relative, but this "totally other" is a definition of the common ground yet.

A good (according to this metaphor itself) metaphor : the auto-conception of the hero in "All you Zombies" of Heinlein.

How can language "resemble" reality ? But language "is" reality designing itself in a dichotomization process. Language is the expression of this dichotomization & the continuation of this dichotomization. Is it the "cause" of this dichotomization ? Neither this hypothesis neither its denial can be demonstrated because they (language & dichotomization) would be parts of the demonstration since they are implied in the "definition" of "demonstration".

Language is the reality expressing itself, & that, it's not arbitrary, in the limits of the pertinence of the "language" in general. But all this is language. Language is inescapable (and this is language that says that language is escapable if one doesn't use language !). Then, either language is the only reality, & problem of correspondence is solved; either there is a reality other than language (to say that language is distinct from reality is absurd since it can be expressed by language only, even if language contains/allows the formulations/hypothesis that it is generated by non-language ; it would mean that "reality" is a wrong term since it means "all that exists" ; now, "reality" is a term of... language ! Language could want to make non-language lose its temper or simply play with itself. By the way, what is precisely doing these remarks ? [something compelled to express through language that it is not language, & never sure to not be betrayed by language ! Proof ? It can not even be sure that this fear makes sense. The demonstration of the contrary, through language, would make everything sure! Thus, would make language "inconsistent" ! (// Gödel)]

It must have some sort of correspondence if language has to express things other than itself. If not, it is as if other reality didn't exist. And it is all the less annoying that "other reality" is a term of language.

Language could just play to betray itself, to make itself lose its temper.

Thus, either "I" am language, either "I" am the expression, through language, of what is beyond/infra language, and I can express it through language only.

I, not only L.D., I, some kind of totality.

The use of a term/word doesn't imply the belief in the existence of its object !

- Coherence theory : true if allowed by the system of rules that governs our experience, our logic (categories) under normal conditions ($><$ dreams, hallucinations…)

But it leads to relativism :

-- Relativist theory of truth: truth relative to culture, language, philosophy…

-- Epistemological relativism: no way of choosing between different epistemic norms; all are empirically equivalent.

- Redundancy theory : "true" & "false" are pleonastic notions : "It is true p is the same as p"

-- explicitly given propositions : "Vinci was creative"

-- described propositions : "She is always right", can be rephrased as : "For all p, if she asserts p, then p is true".

But we don't have a real equivalence. In one case, we have an "unchecked" proposition, "abstractly meaningful" with true & false option a priori equivalent.

In the other case, we have a "checked" proposition, "empirically meaningful" with a posteriori prevalence of one of the true & false options.

The correct formulation is : sentence p is true/false.

(kind of variant of Deflationism)

- Realism & relativism

- Pragmatic theory

-Deflationist theory

-Semantic theory: truth is a property of sentences rather than propositions; sentences can only be

true or false as components of a given language (this follows from 1, because in Anglish, "snow is black" is true) ; it cannot work for natural languages because (a) they are not formally specifiable, and (b) they are semantically closed.

The problem is that truth is limited to artificial languages & relative to each given language (in Hanglish, "A stone sings" is true).

(kind of variant of Correspondence. See next annex)

Categories of truth : analytic/synthetic, a priori/empirical, necessary/contingent.

Logics : predicate (first-order), non-monotone, modal, trivalent, multivalent, temporal, grammatical of non-measurable time, epistemic, doxastic, fuzzy…

The plethora of truth theories & logics is edifying enough to underline the difficulty of the job of defining the concept of "truth" & establishing "truth criteria".

ANNEX VI : Semantic theory

The relationship "is true iff" is fully characterized, for the language concerned, by the axiomatic theory which permits the derivation of theorems of the form "s is true iff p" for every sentence of the language. Truth is construed as a predicated of a metalanguage, such that "sentence S is true in language L" can only be a sentence in the metalanguage (M) of L, where S is mentioned rather than used.

"S is true in L iff p" is a sentence in M, where "S" is the name of a sentence in L, and p is the translation of that sentence into M thus Snow is white is true iff snow is white. The definition of "true sentence for L" in M must entail all sentences of the form above. For this to work, M & L must be formally specifiable.

English is a semantically closed language, a language that includes not only expressions, but also names of the expressions and semantic terms such as 'true' referring to its sentences. Distinguishing between object languages and metalanguages prevents this happening.

Application to the "Liar paradox" :

The Liar Paradox. "Truth" for English sentences is not definable in English.

Proof. Suppose it is. Then so is its complement "False".
Let s be the sentence "This sentence is false" .
Since the phrase "This sentence" refers to s, we have
 s iff "This sentence is false" iff "s is false" iff not s.
A contradiction.

(excerpt from http://www.math.hawaii.edu/~dale/godel/godel.html#LiarParadox)

"S is true in L iff p" is a sentence in M, where "S" ("This sentence is false") is the name of a sentence in L, and p is the translation of that sentence into M. Thus "Snow is white" ("This sentence is false") is true iff snow is white ("This sentence" is false). The definition of "true sentence for L" in M must entail all sentences of the form above. For this to work, M & L must be formally specifiable.

And what about the solution of the Liar paradox ? Not derivable ?

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            S                              P
_____/_____              _____/_____
```
The sentence "This sentence is false" is true iff This sentence is false.

Object language	Translation of S in M

- -
v

The sentence ""This sentence is false" is "decidable"" can only be a sentence in the metalanguage (M) of L.

What is the object of "This sentence" ? Any possible instantiation ? It seems that the problem is not solved, its ground is shift only :

- undecidable because without object: the expression "This sentence" doesn't refer to anything; the autoreferential nature is erased because "false" cannot be a predicate of the object-language L.

- undecidable because of oscillation : reinstatement of the autoreferential nature but then the specificity of the "semantics" theory is erased.

Object/Meta language dichotomy: strange; seems artificial on the one hand, like physical particular systems, but "intelligently" artificial on the other hand because of the nest of/fractal nature each meta/object stratum highlights. Now, is the universe not an "ontologically"/semantically/dynamically closed system like the English language ?

Tarski theory is perfectly exemplar

of the spirit of the birth of the "computer science",

and more precisely of "programming".

Bug or Loop? Tarski's Liar's paradox' solution's translation in algorithm :

If !s

then print

else

if s

then print

This formalization highlights the mechanism of the paradox only. In no way it discredits English in its ability to define "truth" for English sentences.

English can be generalized to a universal language à la Leibniz (though, ironically, the limits appear in "formalism" before all !). Let's simply imagine that English is the only language in the universe or that it's perfectly translatable.

The theory of Tarski is at a meta-meta-level (Language M²) that presupposes, allows to assert the truth of the argument/demonstration above. And what is this M² language ? English, of course ! Not simply a semantically closed language, but a dynamically potentially infinitely semantically expansive language/system (Bergson-Prigogine versus Laplace-Newton-Hawking) (Gödel infinite process), whom the Tarski's theory is only one of the richness, at the same level as

the "transfinite" theory, i.e. the potentially infinitely higher-level process (scale).

At first look, "truth" exists at a meta-level". In fact, it exists at an "infra", "sub"-level since the metalanguage M is 'the product of/included in' a higher level language M² : "natural" language in its english form.

If we take the Russell-Strawson-Ockham "mention-use" debate, where is precisely made this dichotomy ? In English language, of course. This janusian nature is even its force, contrary to the pure formal systems. Irony ?

Really, without wanting to enlarge the cohort/circle of its abusive interpretations, the Gödel incompleteness' theorem is an excellent news !

The argument/proof that "Truth" for English sentences is not definable in English.
For example, let's consider the following syllogism :

All well-conceived syllogisms are understandable

This syllogism is well conceived

This syllogism is understandable.

Let's say that the language L is Engl2, i.e. English (grammatically correct) with 2 premisses/axioms; The axioms are the 2 premises.

Thus, the sentence :

""This syllogism is understandable" is true in Engl2"

is a sentence in the metalanguage M of Engl2 only.

And

"This syllogism is understandable"

is mentioned rather than used.

BUT

"where" is the sentence :

"the sentence """This syllogism is understandable" is true in Engl2" is a sentence in the metalanguage M of Engl2 only. And "This syllogism is understandable" is mentioned rather than used"

true, or simply makes sense ???

In our translatable closed natural language !!! In a sense, it's "pre-axiomatic" !

Tarski develops an axiomatization & focus on language.

I make the demonstration of the already similar natural stake into abyss process, the infinite extension (expansion) of the limits of the self-processing language that constitutes the universe (cfr. Langan).

Now, the artificial aspect of the Tarski axiomatisation must be taken as exemplar of the will of this self-processing & conscious language of clarifying itself. It's a step !

If Tarski is true, he has no way of proving he is right since no possible auto referential justification. Every human is at the same level. Every x is Tarski; Tarski cannot say : Tarski is true. Just : probabilities exist, are great that...

Truth must be translatable (physical transformation rules/equations)

& verifiable according to protocols (science).

But what about "I think about myself ?".

True : connection checked between sounds & objects.

If this checking is pre-/a-verbal (this remark itself is verbal) it's conceived and formulated, and get it's pre-verbal qualification a posteriori, in a retroactive process only.

Truth obligatory linked to a language. The checking of the existence (which already is a "term", thus full of a meaning) if not fundamental is obligatory relative since not communicable anywhere at anytime. In any way, this pre-conceptual situation is a post-conceptual possibility.

Really, natural language is not "semantically closed" but potentially infinitely dynamically expanding.

If it was "semantically closed", this distanciation & the semantic theory would not be possible!

Translation :

If "I" was "semantically closed", my auto-distanciation

& my emergence under the form of a semantic theory would not have been able to emerge!

So, we have a natural language M² that, through a formal meta (in fact "infra") language M in which sentences of a particular language L can be clearly decided true or false, but that contains ontological limits, highlights its own inconsistence but in the same against the grain time, its potentially infinitely expanding limits.

Conclusion : consistent but incomplete or complete but inconsistent language, but both in 1 !

ANNEX VII : On multiples interpretations of sentences

"2 precedes 4"

- True in 2 senses: arithmetically & referentially/ syntactically

- Undecidable in its abstract meaning : "2 (things/persons) precedes (things/persons) 4" (in fact, in all rigor, not possible interpretation because "s" ends "precedes"!).

"4 precedes 2"

- True syntactically

- False arithmetically (semantically)

- Undecidable out of context (referentially).

"2 is prime"

-True arithmetically (prime number)

-True syntactically

-False arithmetically (semantically) (not first integer)

-False orthographically.

"1 is prime"

-True arithmetically (semantically) (first integer)

-True syntactically

-False arithmetically (semantically) (not prime number)

-False orthographically

-Undecidable (referentially).

Let's note that in the meaning of a sentence, the "direction" of the reading, thus "time" component, is important ! From all perspectives other than left-right, the signs don't mean anything !).

Of course, "spatial" components are important too.

"It is tall" is false

"It is tall" is true

but what about

"It is tall" ??? Undecidable !

ANNEX VIII : Autoreferences

Kind of autoreferences :

- complete : word, complete
- partial : blue but as word, it's not autoreferential ; short
- relative : blue if written.

Reference : graphic, syntactic, semantic.

The word "word" cannot be first generatively ! It designs other words that themselves design something abstract or concrete & that themselves sometimes design themselves (meta-level) (linguistic).

And this exegesis itself at a meta level yet: meta meta level (philosophy).

A dictionary contains words with different abstractive levels (dictionary/glossary paradox).

Adequacy definition ?

Autological-heterological adjectives Grelling's paradox :

"Short" is not self-referential in the same way as "black". "Short" presupposes an angle of interpretation ("short" according to which criterion ?)

Autological = self-descriptive ?

Heterological ≠ self-descriptive?

In the spirit of Tarski, autological & heterological can be undecidable (semantic limbo) because of the absence of characteristics in them to which refer their meaning, at least concerning "autological", because in the absence of referentiable characteristics, it cannot be autological ! So, autological would be heterological, & heterological, undecidable.

Autology : some feature in the word or the sentence that corresponds to its definition : black, word, short (according to the scale).

Qualifies what makes reference to oneself in an aspect. e.g. black ink in the word black ; "set of signs" in the word word.

Which aspect of the word autological allow to think that it's an autoreference ?

- not the word itself, if not, all the words would be autological

- not the definition either for the same reason & since the questioning applies to it as much as to the word.

In other words, does the definition "what makes reference to oneself" make reference to itself ?

It seems that no ! Consequently, autological is heterological or undecidable since, the word & its definition excepted, which is the case for any word, there is no aspect to which the definition can refer (more generally, a definition is the description of some aspect, concrete or abstract, an attribute ; autological would be autological if its definition would consist to say : "what has an attribute"). So the word "definition" is autological.

But is "an attribute that applies to the definition" (attribute that applies to "autology") an attribute that applies to autological ?

In autoreferences, definition & its support are on the same level ; it's a regression in the abstractive process, a semantic loop.

But autoreference itself remains in a higher order/meta-level (semantic) descritpion/abstraction.

It can be confirmed by the analysis of the nature of heterological.

Attribute : what doesn't make reference to oneself in one aspect.

Indeed, it seems that there is no feature in "heterological" to which the meaning of heterological can make reference.

Thus the word "heterological" & its definition are heterological. But then, it's not heterological, then it cannot be autological !

In fact, here, either we consider that the autoreference or non- autoreference doesn't constitute a new property/characteristic & the process stops, either that it is & then, confirmation that autological is heterological, & heterological becomes autological, at a meta-level.

It's a situation different from that of the sentence "This sentence is false" which clearly refers to itself. We are here directly at a meta level.

Russell-Strawson-Ockham application (a dico-glossary is the applied Russell-Strawson-Ockham theory).

Distinctions :

- The autoreference = designation of oneself

- An autoreference = what designs oneself

- "Autoreference" = what designs what designs oneself

- Autoreferential = that designs oneself

- "Autoreferential" = designs/qualifies what designs oneself.

What about "heteroreference" ?

- The heteroreference = non-designation of oneself in anyway

- An heteroreference = what doesn't design oneself

- "Heteroreference" = what designs what doesn't design oneself

- Heteroreferential = that doesn't design oneself

- "Heteroreferential" = designs/qualifies what doesn't design oneself.

Is there in "auto referential" something that refers to oneself? No!

Is there in "hetero referential" something that refers to oneself?

<u>Heteroreferential is heteroreferential</u>

- true graphically (to be totally correct, the first "h" would have to be a small & not a capital letter)
- true semantically.

Nothing in heteroreferential that refers to oneself. Thus, heteroreferential is heteroreferential ! Thus, adequacy word/meaning. Consequently, heteroreferential is meta-auto referential.

"Autoreferential" is heteroreferential.

"Heteroreferential" is heteroreferential thus auto referential.

<u>What about "indefinite" ?</u>

- The indefinition = non-definition
- An indefinition = what has no definition
- "Indefinition" = what designs what is not defined
- Indefinite = that is not defined
- "Indefinite" = designs/qualifies what is not defined
- A-definition ? = absence of definition.

- Graphically definite as "indefinite"
- Syntactically definite
- Semantically definite.

The "indefinite" case highlights the singularity of the negation, which is non-conservative :
$$-(-) = + \text{ while } +(+) = +$$

The "negation" is an a posteriori notion that can not be put at the same level as the concept of "being". (Parmenidian resurgence that contradicts the validity of the Leibniz "Why is there something rather than nothing".)

Of course, the concept of "negation", like the "0", remains ironically full of richness.

More than heterological ; it's contradictory.

What's the ≠ with blue? Heterological but maybe not contradictory because a word is not compelled to have a colour while it is to be defined !

Any word is by definition defined.

Word = expression of the connection (designation) between set of signs/sounds & any concrete or abstract entity (that can be sound/sign or set of signs/sounds as well).

But the definition of the word "word" uses words.

Is it consequently a petitio principii ? (// brain which constructs itself, Escher mutually drawing hands…)

The reference is the designation by sign(s)/sound(s) of something other than itself, or of itself. This designation is the "meaning" of the sign(s)/sound(s).

The autoreference is the designation, among others by sign(s)/sound(s), of itself & eventually of something other than itself.

ANNEX IX : Some miniatures

This syllogism is autoreferential.
Autoreferential demonstrations are false.
This syllogism is false (valid & undecidable).

This syllogism is autoreferential (valid & …: if really undecidable, it's true, but then it's not undecidable, thus false).
Autoreferential demonstrations are undecidable.
This syllogism is undecidable.
All the well-conceived syllogisms are valid.
This syllogism is well-conceived.
This syllogism is valid (true).

All the well-conceived syllogisms are valid.
This syllogism is well-conceived.
This syllogism is invalid (false).

This syllogism intends to demonstrate its own absurdity.
The elaboration of a syllogism that intends to demonstrate its own absurdity leads to paradoxical situations.
Paradoxical situations imply the auto-demonstration of ones own absolute coherence.
The elaboration of a syllogism that intends to demonstrate its own absurdity imply the auto-demonstration of ones own absolute coherence.
This syllogism makes the demonstration of its own coherence (valid & false or undecidable).

A well-conceived syllogism is an illusion.
An illusion is inexistent/has no real existence.
This syllogism is well-conceived.
This syllogism is inexistent/has no real existence (valid & false).

A well-conceived syllogism is valid.
A well-conceived syllogism is an illusion.
An illusion is inexistent/has no real existence.
This syllogism is well-conceived.
This valid syllogism is inexistent/has no real existence (valid & false).

A well-conceived syllogism is valid.
A well-conceived syllogism is an illusion.
An illusion is inexistent/has no real existence.
This syllogism is well-conceived.
This invalid syllogism is inexistent/has no real existence (invalid & false).

Preliminary ; demonstration :

tautology = particular case of truth because autoreferential
petitio principii.

- the assertion "this sentence is either true either false" (according to 2VL) doesn't imply that any sentence is either true either false ! Proof :

>   "this sentence is not true" = oscillatory/undecidable

>   "this sentence is not a tautology".

The truth of this sentence depends on the truth of the sentence below.
The truth of this sentence depends on the truth of the abov sentence.
The truth of the above mirror sentences is undecidable.

The sentence below is true.
The above sentence is false.

If the sentence below is true, this sentence is true.
The above sentence is false, this sentence is true.

If the sentence below is false, this sentence is true.
The above sentence is true, this sentence is false.

Tthis sentence is composed of 13 words" = false.

"This sentence is composed of 7 words" = true.

"This sentence is composed of x words" = true.

                                    This analysis intends to apply these concepts :
            connection, oscillation, projection/isomorphism, formalization, diagonalisation/recursion,
                                                                              autoreference to…
            the reality (most general concept) & to conclude the infinite character of its intrinsic process.

ANNEX X : Smith autoreferential items

1) The answer to question four is definitely b.
a) True b) False

2) The answer to only two of these questions is b.
a) True b) False

3) The answer to question one is b.
a) True b) False

4) The answer to three of these questions is true.
a) True b) False

5) The answer to this question is b.
a) True b) False

As truth values of sentences 3 & 4 have to be opposed to that of sentence 1, and as long as one gives privilege to the "nor" option for sentence 5, there are only 4 possible combinations and 2 obvious valid solutions:

1) A
2) A
3) B
4) B
5) Impossible

1)A
2) B
3) B
4) B
5) Impossible

We check the janusian/double nature/identity of sentence 2).

As for the combinations, let's consider that the answer to 4) is A.

The answer to 3) is A too
1) is B
5) is NOR A NOR B

What about 2) ?

If B, it's true and becomes A, if A, it's false and becomes B

So we have an undecidable or "oscillating" situation :

1) B
2) B/A Undecidable
3) A
4) A
5) Impossible

Oscillation of another kind than 5) since depending on other statements while 5) is autonomous ; we could consider the chain reaction which would give something like this.

1) B/A Undecidable
2) B/A Undecidable
3) A/B Undecidable
4) A/B Undecidable
5) Impossible

Until the logical oscillation's collapse:

1) A
2) B
3) B
4) B
5) Impossible

In any case, we don't have a simple impossibility, as the simple declination of the 2V combinations

1) B	1) B
2) B	2) A
3) A	3) A
4) A	4) A
5) Impossible	5) Impossible They are seemingly invalid.

Would lead to think ! It becomes simple "impossibility" if we decide to apply the "nor" option to 2) only, but this is as arbitrary as to include "C" to ZF or not !

In this case, we have a global impossibility added to the impossibility of 5) ; it gives :

1) }
2) } Impossible
3) }
4) }
5) Impossible

By the way, what authorizes us to apply the "nor" option to the sentence 5) ?

What can be the similarity with the quantum undetermination bugbear ?

On the one hand, quanta's nature undetermination, on the other, sentence's value

undetermination ; so, difference of nature of undetermination !

Let's apply the disjonction to 5) & let's observe the logical butterfly effects (chaos) & possible emergent properties.

1) A
2) A/B Undecidable
3) B
4) B
5) B/A Undecidable

Sentences 2) & 5) play boomerang together in a reverse/inverted/opposite alternance, letting the others in their quiet assurance.

Now, this is the simplest case where the first option considered is that proposed by the problem (for the sentence 5, we consider first the answer B; for the sentence 2, we consider first the answer A, since, at this moment, we have indeed 2 true assertions only, i.e. sentences 3 & 4) & where the oscillations are in synchronisation/concordance phases/at the same rate of speed

Let's proceed rationally ! We have to note that 3 depends on 1, 1 on 4 4& 2 on the whole, and that 5 only is autonomous.

If we have to respect the succession with respect to the "meaning"/question, the problem is simply impossible.

If we work pragmatically, we must of course consider first the case of 5, the only one that is not interdependent.

We have an oscillation (undecidable situation) but we can consider first the B option as suggested by the sentence itself. We'll simply have to reverse the values in case of "A" starting point.

Here, either we apply the alternative according to the "sequential" process of considering each sentence in a definite order (an alternance for each sentence considered), either we work in "parallel".

A "period" = 1 oscillation, i.e. a sequence A/A, B/B, A/B or B/A.

i) "sequential" process

We have to consider the sequence "5-2-4-1-3".

If we decide that the absence of answer A or B to an item can be taken into account in the interdependent relations, the game ends with the oscillation of 5.

We look at all the variants until we find a recursive sequence.

Last precision, we have to use the "late" function (automata principle used in the Turing's machine : "exit function = input data + internal variables (past data of the automata)"), only way to take into account the value of an autoreferential sentence.

We decide that the taking into account of itself by an interdependent item is ok if it allows to answer to its own question/confirm its own assertion.

Now, let's go :

5 & 2

1)
2)   2) B   2) B 2) A 2) B 2) A 2) B...
3)
4)
5) B   5) A   5) B 5) A 5) B 5) A 5) B...

5 & 2 & 4

1)
2)   2) B   2) B   2) B   2) A   2) A   2) B   2) B...
3)
4)   4)   4) B 4) B 4) B   4) B   4) B   4) B...
5) B   5) A   5) B   5) A   5) B   5) A   5) B   5) A...

5 & 2 & 4 & 1

1)   1)   1)   1) A 1) A 1) A 1) A 1) B 1) A 1) A 1) A
2)   2) B 2) B 2) B 2) A 2) A 2) B 2) A 2) A 2) A 2) B
3)
4)   4)   4) B 4) B 4) B 4) B 4) A 4) B   4) B 4) B 4) A
5) B 5) A 5) B 5) A 5) B 5) A 5) B 5) A 5) B 5) A 5) B

Note the seemingly paradoxical situation in the 7th & 8th steps, but we have to remember the use of the "late function" process !

5 & 2 & 4 & 1

1)   1)   1)   1) A 1) A 1) A 1) A 1) B 1) B 1) B 1) A 1) A 1) A 1) A 1) A
2)   2) B 2) B 2) B 2) A 2) A 2) A 2) A 2) B 2) B 2) B 2) B 2) B 2) B 2) B
3)   3)   3)   3)   3)   3) B 3) B 3) B 3) A 3) A 3) A 3) B 3) B 3) B 3) B
4)   4)   4) B 4) B 4) B 4) B 4) A   4) A 4) A 4) A 4) B 4) B 4) B 4) B 4) B
5) B 5) A 5) B 5) A 5) B 5) A 5) B   5) A 5) B 5) A 5) B 5) A 5) B 5) A 5) B

We obligatory meet the final oscillations of some kind of Conways "game of life" patterns.

ii) "parallel" process

If data necessary, the determination is impossible :

1) Impossible

2) Impossible

3) Impossible

4) Impossible

5) Impossible/undecidable according to the "nor" or "or" choice !

No data enough to decide.

If no data necessary, then :

1) B
2) B
3) B
4) B
5) Impossible/undecidable according to the "nor" or "or" choice !

The preseance of answers

Let's inspect systematically the variants :

- automatic & regular changes; we must determine periods/sequences (heart's beats?)

- aleatory changes.

Finally, short combinatorics of the combination's game :

The consideration of statement 5 NEITHER true NOR false leaves 16 possibilities to which we have to add the 2) oscillation

$2^4 + 2$ (5) oscillation ; chain reaction & collapse?) + 2 (2) oscillation) + 1 (2) logical oscillation collapse)

What's the lesson to draw from these ranges ?

The decision's momentum determination ! And, more deeply, what's the "nature" of this set of sentences ? Is there any mean to give privilege to one interpretation ?

ANNEX XI : Turing Halting Problem

Framework :

The question is : does a procedure exist that can check if all the programs that generate the reals stop or not.

Reductio ad absurdum : as it is very difficult to show that a problem is undecidable, one considers the contrary true & one shows that it leads to a contradiction; now, if a problem is decidable, it's not obligatory easy to find the procedure : P = NP?

Let's consider the worst situation: a program necessary per real ; the set of programs is countable while the set of reals is uncountable ; it means that some reals are uncountable (reals with infinite number of decimals) because there is no program for them.

Let's check it by the mean of the Cantor's diagonal :

$p1 \rightarrow 0$, d11 d12 d13 d14 d15
$p2 \rightarrow 0$, d21 d22 d23 d24 d25
$p3 \rightarrow 0$, d31 d32 d33 d34 d35
$p4 \rightarrow 0$, d41 d42 d43 d44 d45
$p5 \rightarrow 0$, d51 d52 d53 d54 d55

One considers $x_n = 1 + d_{nn}$, & x the number that is written

$x = x_1 x_2 x_3 x_4 x_5 ...$

$p1 \rightarrow 0,"3"19232731353943475152$
$p2 \rightarrow 0,7"5"808182838485868788$
$p3 \rightarrow 0,71"8"273645546372819092$
$p4 \rightarrow 0,399"0"40914192429343940$
$p5 \rightarrow 0,4788"4"9097030915212728$

$p1 \rightarrow 0,"4"19232731353943475152$
$p2 \rightarrow 0,7"6"808182838485868788$
$p3 \rightarrow 0,71"9"273645546372819092$
$p4 \rightarrow 0,399"1"40914192429343940$
$p5 \rightarrow 0,4788"5"9097030915212728$

$x = 46915...$

It's not in the list of reals generated by the programs, though, $x_n = 1 + d_{nn}$ is an effective procedure of computing the x decimals ! Thus it would be computable on the condition of extending the set of arithmetic.

We cannot have a n^{th} program that stops until it gives the n^{th} number/decimal ; if it was the case, we could compute, consequently, we would have a program that computes a real that doesn't belong to the list of possible countable reals : clear contradiction !

Now, the procedure that checks the persistence or the halting of each program stops if the program doesn't stop & continues if the program stops.

But the procedure is itself a program which has to check its own process; in other words, if it continues, it must stop, & if it stops, it must continue !

Now, let's consider a procedure that has to check if each program that generates a real stops or not. This second machine stops if the program continues & continues if not.

If we chose the reverse process, the checker procedure stops if the real-generator-program stops & continues if it continues, then, the second machine is useless, the initial generator program will be sufficient.

Let's note the recursive/diagonalisation process.

Now, the question is: how many time does it take before the checking procedure stops ?
P = NP ? It must be quickly enough.

Then, this checking-procedure-program is more powerful than the checked programs: it's the reductio ad absurdum & diagonalisation process (to show the impossibility of the halting decision, we show that the hypothesis of its possibility leads to an absurdity).

Finally, we have a "universal", infinite machine that can/must take into account/check itself, since, as well, it's a program, what obligatory leads to an autocontradiction of the type of the "liar paradox", since it must stops if it continues or continue if it stops, making the decision problem impossible !

How is this integration of the procedure itself in its own checking process possible ?

Because of the projection/isomorphism (Gödel) that allows the identification/assimilation of the process to a number, a real (but is it legitimate ? Yes, because of combinatorics laws & Richards paradox).

With Gödel, the contradictory autoreference is one step to conclude to the indecision.

With Turing, the contradictory autoreference is the conclusion of the demonstration.

<u>Simplification of Gödel's proof.</u>

Now, what is this demonstration ? (Krivine, Lambda-calculus)
In the case of Gödel, the incompleteness theorem has a Gödel number. Stake into abyss, nest

of/fractal process, recursivity/retroaction : diagonalization.

In the case of Turing, it has a countable number/integer. Thus, the Universal Machine not only checks its own process but has to be assimilated to the whole reality. Ultimate step of the diagonalization/recursion.

Aborted attempt to solve the diagonalization problem

1 : 357...

2 : p1 → 0,"4"19232731353943475152

4 : p2 → 0,7"6"808182838485868788

6 : p3 → 0,71"9"273645546372819092

8 : p4 → 0,399"1"40914192429343940

10 : p5 → 0,4788"5"9097030915212728

But we can repeat the process of computing a new series of reals from these crossed countable series !

The attempt of making a change of order in the naturals leads to the impossibility to choose/write a number after 1 (infinite regression). We need "set of subsets" cardinality.

What is undecidable ? Hilbert wanted a procedure of decision for "all" the maths, with the help of formal procedures !

Gödel showed that even the arithmetic cannot be complete, a fortiori the entire maths, by the means of formal procedure !

As for Turing, one must have in mind that the Universal Machine is by hypothesis supposed perfectly functioning.

Then, a reductio ad absurdum shows that the "halting problem" isn't solvable because, either the UTM functions "ideally", in parallel, & it must stop and continue simultaneously, what is impossible, either we consider its empirical/concrete functioning, with consequently a starting point &, either it checks/imitates first a finite table of instructions (algorithm = computing procedure = finite) and it stops definitely, either it checks/imitates first an infinite table of instructions and it must continue indefinitely(// Smith sentences oscillations or logical oscillations collapse).

In both cases, we must conclude that the "halting problem" cannot be solved. Thought experiment.

<u>Kinds of undecidability.</u>

Because of :

- meaningless assertion(s)

- absence of verifiable reference

- too great complexity

- too great length.

       If, on the one hand, we admit that the alphabet is finite/limited (in fact, it could increase or decrease ; ASCII), why would the vocabulary be ? It's evolutive/changing. And the combinations of vocabulary ? Infinite. Thus, we can have demonstrations infinitely long & in infinite number !

       Reals with infinite decimals are not countable because this is an infinite of infinite.

ANNEX XII : On the richness and traps of the implication

Here is a formula [P > (-P > Q)] found in the "extremely" interesting article "The demonstration of Gödel" by Ernest Nagel and James Newman, an excellent introduction to the Godel's incompleteness theorem ; the explanations are mine:

P..>..(-P..>..Q)

t...T.....t...T...t
t...F.....t...F...f
f...T.....f...T...t
f...T.....f...T...f

f...T.....t...T...t
f...T.....t...F...f
t...T.....f...T...t
t...T.....f...T...f

1b.2...0a.1a.0b (levels)

If Carl is present, then, if Carl is absent, Carine is present !

In other words, the presence of Carl implies that if he is absent, then, Carine must be present.

Note that the 2d implication let the possibility to Carine to be present despite of the presence of Carl, in addition to her obligatory presence in case of the absence of Carl and the obligatory presence of Carl in case of the absence of Carine ! Indeed, if Carine is absent, Carl is obligatory present, if not, that would mean that his absence doesn't imply obligatory the presence of Carine !

You know, this info is often missed by most people (> 90%) and not understood by some of them even after this simple explanation !

P > Q

t .T .t (modus ponens)
t. F. f
f .T. t
f .T .f (the often missed and not understood info [modus tollens])

To come back to the initial formula, the very interesting thing is the consequence of the absence of Carl in the first implication ; indeed, his absence can imply the presence as well as the absence of Carine if he is absent, as the 5th and 6th lines of the matrices show !

f...T.....t...T...t
f...T.....t...F...f

In other words, while, if we consider the 2d implication only, Carine is obligatory present in case of the absence of Carl, the fact of taking into account the first implication implies an extension of the possibilities (the over-determination enlarges the field of possibilities) and an apparent contradiction between the meanings to attribute to the same variable depending on whether it belongs to the 1st or to the 2d implication ; but this is because there are precisely 2 levels of interpretation of this variable, its presence in the first implication putting it at a meta-level, a superior dimension, a greater level of generalization.

P..>..(-P..>..Q)

t...T.....t...T...t
t...F.....t...F...f
f...T.....f...T...t
f...T.....f...T...f

f...T.....t...T...t
f...T.....t...F...f
t...T.....f...T...t
t...T.....f...T...f

1b.2...0a.1a.0b (levels)

You compare 0a and 0b, which gives 1a, then you compare 1a and 1b, which gives 2.

1a is the matrices of the 2d implication (1st level), 2 is the matrices of the 1st implication (meta-level).

Sub-annex :

How does the implication (conditional) matrices function?

P > Q means P implies Q.

Here the Truth table : (t = true ; f = false) (P = Carl is present ; Q = Carine is present)

P	Q	(P > Q)	
t	t	t	(if Carl is present, Carine must be present)
t	f	f	(if Carl is present, Carine cannot be absent)
f	t	t	(if Carl is absent, Carine can be present)
f	f	t	(if Carine is absent, Carl must be absent ! [this is what most people don't

succeed in grasping, sometimes even with explanations, because they have to consider the situation of Carine first, and then to draw the inference)

Someone wondered if the first line of the matrices

P	>	(-P	>	Q)	
t	T	t	T	t	(1)

contained contradictions ; the answer is "no" ; the "meta" explanation of the 5th and 6th lines is applicable here too.

Nor is the second line !

T	F	t	F	f	(2)

On the other hand, the implications of the lines 1 and 2 are contradictory !

But this is not a problem! Indeed, since the implication doesn't allow to discriminate the possibilities in case of the non realization of the antecedent, the consequence of the realization of the antecedent of the general implication consisting in the evaluation of the consequences of the absence of this same antecedent in the 2d implication, it's not important that this antecedent leads to contradictory conclusions, precisely relative to its absence ; what is important is to know that the 2d implication allows any consequence in case of the negation of its absence, i.e. -(-p) = p ! As soon as this antecedent is realized, any consequence is logically possible !

Now, we have precisely "p", consequently...

Biconditionnal : iff (if & only if)

Conditionnal :

P	Q	(P > Q)	
t	t	t	(if carl is present, Carine must be present)
t	f	f	(if carl is present, Carine cannot be absent)
f	t	t	(if carl is absent, Carine can be present)
f	f	t	(if Carine is absent, Carl must be absent !)

Becomes :

P	Q	(P > Q)	
t	t	t	(if Carl is present, Carine must be present)
t	f	f	(if Carl is present, Carine cannot be absent)
f	t	f	(if Carl is absent, Carine cannot be present) ***
f	f	t	(if Carine is absent, Carl must be absent!)

An additional restriction with line 3.