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NOTAS CRÍTICAS/CRITICAL NOTICES

A Philosophical Life in an Age of Sciences

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Philosophy in an Age of Science: Physics, Mathematics and Skepticism, by HILARY PUTNAM (AUTHOR); MARIO DE CARO and DAVID MACARTHUR (EDS.), HARVARD, MASS., HARVARD UNIVERSITY PRESS, 2012, pp. 608, US\$53.96.

I. THE EDUCATION OF GROWN-UPS

Can philosophy make any sense in an age of Science? Putnam's wonderful answer, based on an insightful comment by Stanley Cavell, is that philosophy is *the education of grown-ups*, that the fact that the questions in philosophy cannot be settled is what makes philosophy an educational imperative. This is neither a tragedy nor is it a symptom that philosophy has come to some sort of end; it simply means that the education of grownups never ceases something that probably holds the clue to the onto-theological problems that have traditionally triggered philosophy in the past.

For Putnam, the key problem of philosophy in an age of sciences revolves around the notion of *realism* whereby we simply mean the belief in our ability to create – in language – successful representations of reality.

Over the years, Putnam has identified the inner dynamics of realism in the form of an unavoidable entanglement between facts and values. Underlying this entanglement there is a naturalized and common-sense version of realism where the *constitutive* role of values emerges in the form of *conceptual relativity*. This constitutive role, in contrast to its Kantian ancestor, has an intrinsically *external* content. As a result, conceptual relativity opens the window to forms of objectivity without a predetermined ontology; a form of objectivity that aims to avoid the dangers of metaphysical solipsism inherent to any form of egocentric language.

II. CONCEPTUAL RELATIVITY

What is conceptual relativity? In a nutshell, and using science and in particular physics in order to frame the discussion, the notion of conceptual relativity appears when the same phenomena can be explained by using two different representations that, although inter-translatable, do not preserve ontology. In order to illustrate conceptual relativity Putnam uses both a difficult example taken from quantum field theory (dualities) and a simple one based on mereology. To make the notion a bit clearer let us describe in some detail how conceptual relativity actually works in physics.

What we normally do in physics is to *represent* a physical system in terms of two basic ingredients: *the degrees of freedom* (in other words the fundamental *constituents*) and the *interactions* among these constituents. The theory is given once the laws of interaction are specified while the ontology is determined by the choice of constituents. Once you set this representational frame, observable quantities are defined as concrete functions of the distributions of constituents. These distributions depend on time and are determined by the laws of interaction.

A priori, we can imagine different representations leading to the same results; i.e., we can think of different choices of degrees of freedom as well as different laws of interaction and so represent the *same* observables as some new functions of the distributions of the new degrees of freedom. Of course, in order to do this, we need rules of translation which allow us to transform the distribution of one set of degrees of freedom into the corresponding distribution of the alternative set of degrees of freedom. One example of these transformation rules are the *dualities* Putnam mentions as an example.

We may be interested in proving, on the basis of the formal structure of the theory, that such changes of degrees of freedom i.e., of ontology, are logically possible. However, what we are after is to unveil the actual use and meaning of these changes of ontology in scientific *practice*. What reason might a scientist have to look for an alternative ontology i.e., for using a different set of degrees of freedom?

The key to answering this question lies in an aspect that is normally ignored in typical discussions on ontology, namely the *interactions*. A representation is *simple* to work out if you have been lucky and the interaction among the constituents is *weak*. This means that you can define a clear demarcation between constituents and the way they interact. Although this certainly goes beyond the target of this note I would like to draw the reader's attention to the tendency to ignore interactions in ontology. The historical root of this tendency lies in the teleological assumption of interpreting change (which is after all the simplest and more explicit effect of interaction) not as Being but as Becoming. Wittgenstein's *Tractatus* is a dramatic example where interactions are ultimately understood and reduced to possibilities.

In the *Tractatus*, the sources of interaction transform into the capacity of objects to contain in themselves all possible states of affairs where they can participate (*Tractatus* 2.014). In a certain sense, in the *Tractatus* interactions become a sort of *modal action at a distance*.

After this short digression we might now imagine that for some reason the interaction strength among the constituents becomes strong (this is what in physics is called a strong coupling problem). The problem is that now the very notion of “constituent” starts to lose its meaning. In a certain sense the effects of the interaction are so important that the demarcation between what are intrinsic properties of the constituents and what depends on the interaction with others, becomes artificial. In practical terms this implies, among other things, that it is impossible to compute anything. Generically, the practice of science is the art of defining good approximations i.e. the art of identifying what could count as small (weak) perturbation. It is only relative to this underlying notion of weakness that ontology acquires its real practical meaning.

Hence, what might be the most natural solution to the *strong interaction* problem? Of course, it would be to change ontology in such a way that the strong coupling effects for the original ontology become weak coupling effects (that you are able to manage to work out and *understand*) for the new one.

What philosophical lesson should we take from this discussion? Namely, that ontology relies on a rule of representation; that is, to represent the system in terms of constituents and interactions among them. However the limits of applicability of this representation are set by the interaction strength. Whenever the interactions are strong the representation becomes useless and we should change to a new representation where the interactions are weak.

Wittgenstein Actually – we will clarify this point later – what Wittgenstein realized in the *Investigations* is that, contrary to the *solipsistic flatness* of the *Tractatus*, a *form of life* requires many different charts (language games).

Quine taught us to define ontology as those entities that the existential quantifiers range over, in particular those existential quantifiers used in the formulation of scientific theories. However, it is important to keep in mind that real scientific theories have a *range of applicability*. The entities which existential quantifiers range over are not immune to this constraint. Thus, and in an attempt to give a practical notion of ontology, I will suggest that ontology be defined as *those entities that interact weakly*. In the geometrical metaphor we have previously employed, a chart is the region of space that we can safely think as flat, where flatness here is the analog of weakly interacting. But again if reality, *as a matter of fact*, is not flat we will be forced to use several charts i.e., we will be forced to deal with a chart-dependent ontology.

III. INTERNAL REALISM OR EXTERNAL REFERENCE?

A great amount of the first part of the book deals with the problem of realism and how Putnam's approach to this philosophical issue has evolved over the years. Putnam describes his present point of view as a sort of metaphysical realism, one that denies verificationism yet accepts conceptual relativity. The key to this transition lies in abandoning the verificationist semantics that lie at the very core of internal realism.

Metaphysical realism can be identified with the claim that truth outruns any form of justifiability. Internal realism is based on a metaphor of Kantian flavor, namely the metaphor of *idealized justifiability* and the consequent claim that truth is just the idealization of justifiability. Within this metaphor the notion of idealization is used in a way similar to many other ideal notions in the physical sciences (notions such as frictionless, unextended or rigid). However metaphysical realism outruns even this idealized form of justifiability. In fact, the idealization that Putnam has in mind leads to a notion of truth that is unable to neutralize the consequences of the Lowenheim-Skolem theorem; something that in Russell's terms could be expressed as *the impossibility of defining a backwards road from truth into meaning*. In summary, Putnam's original refutation of metaphysical realism was based on showing that even idealized justifiability cannot avoid Skolemization.

What was unclear in the characterization of internal realism was the notion of idealization, or more particularly how Putnam used external reference as a way to support the sense of idealized justifiability.

Semantic externalism is the claim that reference is not determined by the mental state of the speaker, but by the *environment*, in a way that is social and that moreover involves some external assumptions about conceptualization schemes such as causal chains (for proper names) or identity of internal structure (for names of substances). While a priori this externalism in semantics might be superficially regarded as creating a hope for the metaphysical realist, Putnam used it instead to design a quasi- (or neo-) Kantian answer to the problem of scientific realism.

Semantic externalism thus explains two basic facts, the stability of reference relative to which progress in science can be understood (in contrast to Kuhnian incommensurability) and the external dependence of reference on the conceptualization schemes. These two ingredients provide a new version of the *constitutive role* of reference in objective experience.

Against this backdrop, what are Putnam's views today? In short, Putnam remains attached to the consequences of Skolemization (although now expressed in his version of conceptual relativity), but has replaced the inner Kantian constitutional role of semantic externalism with a more or less Wittgensteinian common-sense realism.

More precisely, internal realism failed (as Putnam now recognizes) to account for the real role of the *environment in semantic externalism*. In the internal realist approach, the environment – generally the external component of reference – was “Kantianized”. As a result, the connection with the environment was not an external link to some mind independent reality (*the arms of the liberalized functionalism* advocated in several chapters) but was instead an internal link to its Kantian condition of possibility.

The artificial reconciliation of semantic externalism and verificationist functionalism thus pushed Putnam into the realms of science fiction. Once you have discovered the external component of reference, you can try to abstract from it (simply ignoring all the external factors) and define a notion of *narrow content* that only refers internally to your functional brain state. In addition, you can define as *wide content* that which corresponds to standard use and that endows the external factors. In the simplest example of twin earth, a twin earthling shares the narrow content of water with us although her wide content is manifestly different. The problem now is how this wide content monitors the use of narrow content. The verificationist postulate reduces meaning to some verification where you are forced to use exclusively narrow content. However, what will count as justifiability, moreover as justifiability in idealized cognitive conditions, is somehow determined by the constitutive role of wide contents. The wide content of *gold* – for instance – should be able (within this scheme) to set the ideal conditions of justifiability of any claim on the nature of a given piece of material. In this cognitive *fixed point* (which defines ideal justifiability) wide contents and narrow contents work in perfect Kantian harmony. Semantic externalism works here as a “Kantian turn” against skepticism. Those metaphysical notions (attached to wide contents) that the skeptic thinks are empty acquire a well-defined sense through the use of wide contents in the constitution of idealized justifiability. The change with respect to Kant lies in shifting Kantian *objective experience* into Putnamian *idealized justifiability*. This can solve skepticism but, as Putnam points out today, not necessarily solipsism!

The metaphysical notion of an objective reality acquires meaning in the framework of internal realism in the same way that the notion of objectivity acquires meaning in the first Kantian Critique. However as is also the case with the Kantian solution, once we have this meaning we feel the need to extend its use beyond its reduced *internal* scope. There is a beautiful sentence along these lines at the end of the first chapter of the second Critique when Kant draws our attention to the fact that we are not happy with this reduced inner use of concepts such as cause. A similar feeling is also at the root of the attempt to avoid the unavoidable solipsism of the internal version of realism. But we are talking of the second Critique i.e., we are approaching the realm of Practical Reason. Incidentally, in chapter 22 Putnam refers to a similar feeling in connection with a comment by Reichenbach on the limits of ego-centric language as a tool to *justify our actions*.

Here we can foresee a natural last stop in Putnam's journey; a *practical* understanding of the external components of reference. This is the precursor to the fact-value entanglement, although (and this is enormously important) the *moralization* of the external component will not follow the steps of Kantian Ethics, but will rather be established on the basis of a new Ethics – without ontology – triggered by conceptual relativity. But before reaching this point we need to go through several more steps. In particular, we should go back to quantum mechanics and to the real “missing link” of realism: *the meaning of the environment*.

IV. QUANTUM MECHANICS: THE MANY FACES OF THE ENVIRONMENT

The foundational problems of quantum mechanics have been a constant in the intellectual life of Putnam. From the very early stages of his career when he was under Reichenbach's influence until now, working on a future paper in collaboration with David Albert, Putnam has used the foundational problems of quantum mechanics as a touchstone of many of his philosophical views. But what is Putnam's interpretation of quantum mechanics? It is probably easier to say what he does not like and why.

Putnam identified at a very early stage one of the most dangerous problems of the so-called many world interpretation. In the original version of this interpretation, there is not clear meaning for the standard probabilistic interpretation of quantum mechanics as encoded in the Born rule. This was certainly a weak point of the many world approach, as Putnam has stressed on several occasions. Reading between the lines it is clear that Putnam would feel happier with an objective approach to the collapse of the wave function that embraces the orthodoxy of the Copenhagen Interpretation. In this section I will try to place some foundational problems of quantum mechanics in a Putnamian philosophical perspective by stressing the key role of the environment. While the presentation will be necessarily short and somewhat superficial, it will hopefully shed some light on how some notions such as semantic entanglement and semantic externalism are connected with the current discussion on the foundations of quantum mechanics.

The modern approach to quantum mechanics is based on *entanglement*, *de-coherence* and *environment*. Although the world is in reality quantum, whereby I simply mean that \hbar is non-zero, it is obvious that *quantumness*, such as interference phenomena, is not taking place among the typical macroscopic objects of our daily life, such as our cats or our beds (to take two classic examples, one from Schrödinger and the other from Einstein). This common-sense daily ontology behaves classically. Of course, it would be very puzzling if this *classicality* were to depend on some exercise of con-

sciousness on our behalf (as observers). Thus, the first problem is to understand the *objective* origin of this classicality.

In warming up, it is important to avoid some obvious *grammatical mistakes* that permeate some standard dramatizations, such as the famous example of Schrödinger's cat. It is pretty obvious that notions such as being alive or dead cannot be even defined without taking into account the (entanglement with the) environment. If a cat is alive will eat and excrete, and if it is dead it will rot. This heavy exchange with the environment means that properties such as being alive or dead can be only predicated of the *cat-cum-environment*, and not as ideal Platonic properties of some equally Platonic entity (such as an isolated cat). If we forget this simple fact, we might be tempted to project the normal use of alive and dead to the isolated Platonic cat and wonder about the strange situation where this Platonic cat is in a quantum superposition half alive and half dead. Technically, the problem is that being dead/alive is not a good way to define a basis for whatever could be the isolated quantum cat. In other words, the grammar of alive and dead is a grammar of cats-cum-environment but not of cats in themselves (whatever that could mean). Quantum mechanics is enormously sensible to these errors in grammar (choice of basis).

The modern way to address the problem of the emergence of classicality uses in an essential way the *environment*. Simplifying, the idea is the following: you divide reality into two systems whereby one is the system you are interested in, for instance your cat, and the other is the environment. The environment is defined by two key properties: i) it is something that you are not monitoring, and ii) it interacts with the system. Point ii) means that your cat is entangled with the environment, something you are not monitoring. Since you do not know the corresponding quantum entangled state, you had better trace over, *coarse grain*, on the possible states of the environment. As a consequence of this coarse graining, you end up with what is called a *density matrix* i.e., with some concrete probability of your cat being either alive or dead (i.e., with your cat having some property that can be predicated of the *cat-cum-environment*).

However these properties (for instance being alive or dead) although properties of the *cat-cum-environment*, are also properties we ascribe to the cat. We say that it is *this* cat that is alive or dead, and we say that because the environment is not destroying the cat i.e., it is not interacting too strongly with the cat. In other words, the environment is playing a double role. On the one hand, it is giving meaning to our classical representational scheme of thinking about our cat as alive or dead; properties that depend on the strong interaction between the cat and the environment. But on the other hand, it is preserving (through quantum de-coherence) some *ontological identity* of the cat as a typical classical object, something that depends on keeping this interaction with the environment weak enough.

This discussion on quantum mechanics leads to two important philosophical lessons. One is that the environment sets the range of applicability of our representational schemes as well as the natural (weakly interacting) ontology consistent with this representational scheme. What we characterize as environmental noise indirectly sets our ontology, but only if the noise is weak enough. Traditionally, philosophy has grown upon the fantasy that noise can be ignored (the case of the Platonic cat) or at least internalized (reducing the cat to a set of sensorial impressions). That this fantasy leads to solipsism is (in my opinion) the second transversal lesson (developed through the concept of indispensability) to be extracted from Putnam's recent thought. In quantum mechanics this fantasy takes the form of grammatical mistakes where entangled-*cum*- the environment notions such as alive or dead (for cats, but also for ourselves) are illicitly used as non-entangled notions applicable to Platonic Schrödinger's cats (or Platonic selves).

V. INDISPENSABILITY: MATHEMATICAL REALISM

Putnam's indispensability argument attempts to show that if you are a realist with respect to physics you cannot (at the risk of becoming incongruent) be an antirealist with respect to those parts of mathematics that are *indispensable* for doing physics. What is interesting about this indispensability principle is that it allows us to link realism in physics to realism in mathematics and vice-versa. This leads to a set of very interesting questions in the foundations of mathematics such as: what form of mathematical realism fits – under the indispensability map – with the common-sense version of realism advocated by the latest Putnam?

As noted above, the present version of Putnam's realism rejects verificationism but admits conceptual relativity. The equivalent in mathematics would be a version of realism that refuses to identify mathematical truth with provability, but admits the corresponding version of conceptual relativity. But, how is conceptual relativity manifests in mathematics? This is one of the most fascinating topics of the recent philosophy of Putnam. To address this issue we need to go through some of Putnam's Wittgenstenian insights.

The famous Wittgenstenian problem on *rule-following* is rightly presented by Putnam as the claim that any model that attempts to account for whatever underlines rule-following is unavoidably non-sensical. It is obvious, at least from a sane common-sense point of view, that we learn to follow rules, that we actually follow rules quite successfully in our normal life, that we easily manage to discover mistakes in rule-following, that we have available efficient procedures to correct those mistakes and that we can teach rules to other people. However, when we try to model all these practices in a way that accounts for the *mechanism* underlying the action of rule-following we

inevitably run into problems. Whatever model we decide to use, it will contain an external component that should explain the criteria under which a given practice qualifies as a case of rule-following, and an internal component that should explain how the agent himself knows that what he is actually doing fits a case of rule-following. If the criteria you use are based on some form of *verification* then the problem cannot be solved, either externally or internally. The obvious reason, stressed by Kripke's reading of Wittgenstein, is that any rule involves infinite cases, while verification, irrespective of how complete it might be, is intrinsically finite.

The standard verificationist reading of Wittgenstein as claiming that the notion of following a rule as well as the normativity of rule-following is explained in terms of the notion of conforming to the standards of a community does not neutralize skeptical worries based on the finiteness argument. The community itself, whatever that might be, is equally finite both in the number of its members as well as in the number of possible tests to be carried out within any *concept-attributing game*. Thus, according to Kripke, we should accept the skeptical reading of Wittgenstein and conclude from here, as Hume did with respect to the problem of causality, that there is no *fact* (in a hard metaphysical sense) whose existence determines either the normativity of rule-following or its meaning. In perfect parallel with Hume, the outcome of this discussion is that talking of one concrete action as being a case of rule-following is just as non-sensical (under Hume's point of view) as it is to talk about the *necessary* causal link between two *concrete* events. However, we can talk of rule-following for classes of actions in concrete contexts or games, but then we are not talking about norms (in any sense that links norms to necessity) but instead simply about regularities or habits.

If for a second, we come back to Kant's reaction to Hume's problem, we will see that Kant accepted Hume's argument but that he did not conclude from here that the concept of a cause was meaningless. In other words, in order to make sense of causes, Kant did not suggest any mysterious noetic extension of our *experience* that is able to put us in direct contact with necessary connections among noumena. Instead, what he did is to abandon the Humean *verificationist* account of the meaning of *cause*. Here, we should remember three important ingredients in Kant's strategy. First, he was able to give a transcendental meaning to concepts such as cause by invoking its *constitutive role* in experience. Secondly, he thought that Hume's argument extends to the realm of mathematics, provided mathematics is not reduced to pure analytic statements. And finally, he thought that the meaning of concepts such as cause are necessary to organize the *practical side of our lives*.

Common-sense realism regarding rule-following, and in particular the type of common-sense realism on rule-following that Putnam extracts from Wittgenstein, shares some of these Kantian ingredients. In particular, the attempt to give meaning to rule-following beyond any verificationist format,

the feeling that we should be realist or at least anti-antirealist in mathematics, and finally the conviction that the extension of meaning beyond the borders of the verificationist principle is necessary for rationally developing the practical activity of justifying most of our actions.

But what is specifically Putnamian in Putnam's common-sense realism? In brief, I would say that the Putnamian essence lies in the *indispensability argument*. To see this, let us reconsider Kripke's skeptical example regarding arithmetic rules from the point of view of the indispensability argument.

Addition is certainly a rule, but we should not forget that an essential and *indispensable* aspect of this rule is its use in, for instance, counting objects. If we consider the rule of addition, isolated in its pretended purity, then we can easily wonder if we are adding or q-adding, where with q-adding we can introduce any form of rule that shares with addition all possible criteria of verifiability (regarding answers to concrete examples of addition) until the current time. However indispensability implies that q-adding is also q-counting, if q-adding is anything related with adding as we use this rule. But q-counting leads to a new set of problems. The meaning of counting is implicit in statements like "The number of atoms in this piece of material is N", and if you are using the notion of q-counting probably you will also be using some form of q-number and consequently also a notion of q-atom. The rule of addition is entangled with the rule of counting and with statements where we specify the number of objects, atoms, molecules or whatever. We can invent new notions of addition that can play in the same team as the Kripkean skeptic, but we are forced to invent the corresponding notions of counting and to reinterpret those statements where we specify the number of objects, atoms, molecules or whatever. The apparent problem about rule-following for addition becomes a contagious disease that creates a similar difficulty about counting and consequently about statements where you specify numbers of objects, and therefore about the notion of an object and finally about *any concept*.

The deep move in Kripke's argument on following rules was to suggest that somebody, let us call her Joan as Putnam does, does not only understand *plus* as *q-plus* but that she understands all other possible words in a different way. In sum, Joan is speaking a *hidden* q-English that by definition passes all possible tests of the *concept-attributing game*. Once we reach this point, we can say something very Quinean as well as Wittgensteinian, namely that there is *no fact of the matter* as to whether Joan is speaking English or q-English and that this is the case even for Joan *herself*. But, we can try to derive something much more radical, as Kripke did in his reading of Wittgenstein, namely that what Joan is doing (and obviously she is doing something since she is speaking as we do) is not something that depends on any form of *fact* that we can ascribe to Joan *herself*. The underlying reason is that what Joan is doing implies following certain rules and following rules only makes sense (as de-

rived from the Humean version of the argument) when it is predicated of *Joan-cum-a-community* but not of Joan herself!

I believe Kripke's reading of Wittgenstein completely misses the point that Wittgenstein was trying to make. Two basic facts should be kept in mind when considering this argument. First of all, Wittgenstein used the notion of a language *game* – and not simply of language – and what is more important, he insisted on using this notion in the *plural*. If we want to get an approximate picture of the vague notion of language as a family of language games, we could think of language as a manifold covered by an atlas of local patches with non-trivial transformation rules between adjacent patches. In this metaphor each patch represents a language game. Through the overlapping regions, and by means of transformation rules, we can move from one patch to another; in other words, we can extend the use of a concept in a language game to other uses in a different language game. In this metaphor, language is charting reality, and reality as external to language manifests itself in *the need to use several different charts*. Wittgenstein's main metaphysical insight lies in his postulating the *need* for several patches to chart a form of life. To put it in another way, his intuition can be simply expressed (following the metaphor we have used to illustrate the notion of conceptual relativity) by saying that for Wittgenstein reality is (*as a matter of fact*) not flat. Incidentally, the existence of overlapping patches is very closely related to the Putnamian notion of indispensability, with *mixed statements* effectively working as transformation rules.

In a nutshell, the key point of the notion of language games (note the plural) lies in the fact that *novelties* – in particular *environmental novelties* – force us to extend the scope of our game. Generically, environmental novelties set the *range of efficient applicability of a game*; once we reach the limit of applicability we need to improve our game. Very often these improvements involve changes of ontological commitments and mixed statements and will eventually settle down in the form of different contiguous patches. This situation we are describing very superficially is by no means an anomaly but is the standard state of facts in normal human life.

In this framework, Wittgenstein's key point is that *nothing in our mastery of a given game uniquely determines how to extend the game to account for environmental novelties*. While this problem can be superficially read in the spirit of Kripke, it is dramatically different. The issue is not how I can know that tomorrow I will add up in just the way I am doing now. The problem is that even if I have passed all possible tests of the concept-attributing game, neither this grasp of the concept nor the whole community are able to determine how to extend the game to deal with any potential *novelty*. A new chair is not a novelty in the application of the word "chair" and it is precisely the exposure to new chairs that is normally used in the concept-attributing game. However, the discovery of unstable atoms or, even more simply, the

discovery of mathematical laws of mechanics (as stressed by Putnam in his choice of mixed statements) is this sort of novelty.¹

We can describe the philosophical point we are trying to extract from Wittgenstein in simple terms that make very explicit the deep departure from the *Tractatus: language by itself is unable to set what is possible*. Reading between the lines, I have the impression that Putnam has a similar idea in mind, for instance when he describes the case of non-Euclidean geometry in chapter 24.

Extensions are needed whenever we go beyond *the range of applicability of the game*. They require *changing the conceptual chart*; a change that involves transformation rules normally expressed by means of mixed statements. The philosophical illusion that Wittgenstein was attempting to nullify, consists in the belief that there exists a special set of coordinates that can reduce the *atlas* of language games (notice again the plural) to just one and very special language. It is this apparently unique (ideal) language that is private, *egocentric* or, if so preferred, *community-centric*. It is in this language where you ask for normativity with the secret goal of *getting rid of the possibility of novelty*, or in other words with the goal of reducing novelty to modality. The main point of the second Wittgenstein is that there is *no language*, but languages working like different charts when we are covering a variety. The illusion of just one chart, the illusion of *flatness* on which the Carnapian epistemological program of reductionism was essentially based, requires two metaphysical fantasies. On the one hand, the fantasy that everything possible is already written in that super-language; and consequently, on the other hand, that the rules of that language already determine all possibilities. Solipsism is a spin-off from this metaphysical credo, if we translate solipsism as *the (modal) nullification of environmental novelty*.²

But after this long digression, we are missing the initial target on how indispensability sheds light on mathematical realism. Following Putnam, let us imagine that the trajectory of a material body is set, within Newtonian mechanics, by a certain differential equation and that it is the case that under certain conditions the solution to this differential equation cannot be obtained by a recursive procedure. In these conditions we cannot prove that the solution is such and such. But the interesting problem is how the condition of being *recursively calculable* (crucial for some verificationist approaches) is extended (by means of mixed statements) to, for instance, the game of mechanics. Normally, any physicist will tend to say that recursive calculability does not reflect any *objective* physical property of mechanics, and that what indispensability implies is that you cannot forget this claim by practitioners of Mechanics, when you try to figure out what recursive calculability *means* in the pure mathematical game. In other words, the point of indispensability is that mathematics is not an isolated game but instead it overlaps with other games and this overlap is an essential component to unveil its meaning. The Goedelian concern over the tension between provability and truth does not point toward Platonism but instead to the indispensability of mathematics.

VI. QUINE AND WITTGENSTEIN: A PUTNAMIAN SYNTHESIS

Quine achieved fame by nullifying the classical demarcation between analytic and synthetic. In my opinion, Putnam is right in seeing (following Cora Diamond's metaphor) the "face" of Wittgenstein in this Quinean lesson. The notion of analytic as what is confirmed *no matter what* could make sense within one language game, provided that the game can set what matters. But what matters changes when we move into the overlapping game, and there is no way to set *a priori* what might matter under any environmental novelty. What Wittgenstein thought was deadly wrong in the *Tractatus* was the claim that language uniquely sets what is possible and I believe the same feeling triggered Quine in his criticism of the analytic-synthetic demarcation. The famous Quinean circularity between analytic and synonymy can be seen as a spin-off of the one underlying use and rule (of use).

Quinean ontological relativity shows that there is not fact-setting ontology in absolute terms, while Putnamian conceptual relativity (as well as Wittgenstein's insistence on the *plurality* of entangled language games) tries to show that – as a matter of fact – we need to use several representational schemes. The new skepticism (if such exists) is not about necessity – in the Humean sense – but about Kantian possibility itself. Reality does not reduce to a static ontology complemented with *a priori* modality, but to many overlapping indispensable ontologies (each bringing its own modal chart). Conceptual relativity preserves neither ontology nor modality.

In summary, the Wittgenstenian slogan is not "meaning is use" but "meaning are *uses*" with the several uses being "*as a matter of fact*" *irreducible as well as indispensable*. Here lies, in my opinion, Wittgenstein's hard-core realism, the essence of the rule-following problem, and the ultimate meaning of Putnamian conceptual relativity.

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NOTES

¹ Notice that novelty is not the same as an anomaly that can be solved by making explicit something that was supposedly implicit. To reduce novelties to this sort of

anomalies is what underlines Wittgenstein's unfortunate universal reduction of philosophical problems to grammatical mistakes.

²One aspect worth noting is that jumping between adjacent charts (something needed as a matter of fact) generically requires judgment and therefore, the use of cognitive values. This makes explicit, in a different guise, the fact/value entanglement. I thank H. Putnam for this insightful observation.

RESUMEN

En esta nota recorremos la filosofía de Putnam haciendo énfasis en el uso de la relatividad conceptual en la práctica científica. En contraste con la noción quineana de relatividad ontológica la relatividad conceptual es "como asunto de hecho" inevitable en la práctica. Este hecho revela una nueva forma de aproximarnos tanto a la ontología como a la modalidad. Desde este marco trataremos, entre otros aspectos, la idea Wittgensteniana de juegos de lenguaje y algunos aspectos de las paradojas asociadas con la noción de regla.

PALABRAS CLAVE: *relatividad conceptual, enmarañamiento conceptual, externismo.*

ABSTRACT

In this note we shall go through Putnam's philosophy, making special emphasis in the use of conceptual relativity in scientific practice. By contrast to Quinean ontological relativity, conceptual relativity is as a matter of fact unavoidable in practice. This reveals a new approach to ontology as well as modality within which we frame, among other aspects, Wittgenstein's notion of language games and the paradoxes of rule-following.

KEYWORDS: *Conceptual Relativity, Semantic Entanglement, Externalism.*