The Error of the Instrument: Why Parsons' Incompleteness and Quantum Indeterminacy are Ontologically Incommensurable Categories

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Abstract

Arroyo and Valvassori (2025) [3] utilize the 'Toolbox approach' to metaphysics, applying Parsons' Nuclear Meinongianism [8] to the problem of Quantum Metaphysical Indeterminacy (QI). They rigorously construct a *reductio ad absurdum* based on a central trilemma: (P1) Standard non-relativistic quantum mechanics entails QI; (P2) This QI is conceptually equivalent to Parsons' notion of property incompleteness (MI); and (P3) Parsons' Incompleteness-Entails-Nonexistence Principle (IENP) [10] is valid. This conjunction necessarily leads to the empirically false and ontologically untenable conclusion that quantum objects are nonexistent. Arroyo and Valvassori resolve this paradox by rejecting P3, thereby proposing a modified Meinongianism that accommodates existent-but-incomplete objects. This article argues that their diagnosis, while methodologically sound, is fundamentally mistaken in its target. The error lies not in P3 (IENP)—which we argue is an essential, load-bearing component of Parsons' meta-ontology separating *existentia* from *fictionalia*—but in the unexamined 'bridge thesis' of P2. We demonstrate that QI and MI are conceptually distinct and ontologically incommensurable categories. QI, as evidenced by phenomena such as superposition and contextuality, is a positive, ontologically *complete*, non-classical state with verifiable causal efficacy. Conversely, MI is an *ontic gap*, a definitional absence. Consequently, the Parsonsian framework is not merely an 'instrument' in need of modification, but an ontologically inapposite tool for the analysis of physical reality.

Keywords: Quantum Metaphysical Indeterminacy; Nuclear Meinongianism; Terence Parsons; Property Incompleteness; Kochen-Specker Theorem; Toolbox Approach to Metaphysics; Ontology of Quantum Mechanics; Ontic Gaps; Value Definiteness.

1 Introduction: The A&V Trilemma and the Wrong Target

1.1 The Locus of the Problem: Indeterminacy in Quantum Ontology

Standard non-relativistic quantum mechanics (QM) poses one of the most profound challenges to classical metaphysics. It directly confronts the intuitive, classical-realist assumption of "value definiteness"—the principle that physical systems possess well-defined values for all of their properties at all times [1]. The theory's formalism describes physical systems not via determinate values, but via a vector state, $|\psi\rangle$, in a Hilbert space. In situations of superposition, this vector state explicitly describes the system as lacking a definite value for a given observable (e.g., position, spin). This is not, in the standard interpretation, a reflection of epistemic ignorance, but a statement of objective, metaphysical indeterminacy [1].

This challenge is further radicalized by the Kochen-Specker (KS) theorem [5]. The KS theorem demonstrates, independent of any specific state, that the very algebraic structure of quantum observables forbids a consistent, non-contextual assignment of definite values to all observables

simultaneously. This structural constraint establishes that indeterminacy is not merely a feature of specific preparations (like superposition) but is a fundamental, structural feature of the quantum world itself. The philosophical question, therefore, is not *whether* metaphysical indeterminacy exists (assuming the standard formalism), but how it is to be *ontologically characterized*.

1.2 The 'Toolbox' and the Arroyo-Valvassori Proposal

It is precisely this question of characterization that Arroyo and Valvassori (henceforth A&V) address in their recent work, "Incomplete yet existent objects: a Nuclear Meinongian approach to quantum metaphysical indeterminacy" [3]. Adopting the "Toolbox approach" to the metaphysics of science [4], A&V propose to "engage with extant metaphysics" [3, p. 7] to interpret this quantum indeterminacy. The specific instrument they select from the toolbox is the sophisticated meta-ontological framework of Terence Parsons' Nuclear Meinongianism [8].

Their choice is prima facie compelling. Parsons' theory is one of the few rigorous philosophical systems explicitly designed to handle objects that are "indeterminate" in some respect. It does so by positing a class of "incomplete" objects, most famously fictionalia (like Gandalf) or abstracta (like "the golden mountain"), which are defined by a 'nuclear' set of properties but lack others (e.g., Gandalf is neither "having exactly 100,000 beard hairs" nor "not having exactly 100,000 beard hairs") [3, p. 9]. A&V's project is to test whether this category of "incompleteness" (MI) can be productively mapped onto the "indeterminacy" (QI) of quantum mechanics.

1.3 Deconstructing the A&V Trilemma

A&V's analysis proceeds by constructing a rigorous logical conflict—a trilemma that leads to a *reductio ad absurdum*. The argument structure, as presented in their text [3, p. 13], can be formalized as follows:

- **Premise 1 (P1): The Quantum Thesis.** Standard quantum-mechanical objects (e.g., an electron in a superposition state) are metaphysically indeterminate with regard to their full set of properties. (This is taken as a given from the physics, as per Section 1.1).
- **Premise 2 (P2): The Bridge Thesis.** This metaphysical indeterminacy (QI) is the physical realization of what Parsons' meta-ontology defines as property incompleteness (MI). As A&V argue, "quantum metaphysical indeterminacy and Parsons' Nuclear Meinongian completeness fit the situation" [3, p. 14].
- **Premise 3 (P3): The Meinongian Thesis (IENP).** All incomplete objects are necessarily nonexistent. This "Incompleteness-Entails-Nonexistence Principle" (IENP) is a core tenet of standard Parsonsian metaphysics, serving to separate the domain of existing objects (all of which must be complete) from the domain of nonexisting objects (which may be complete or incomplete) [8, 10].

The logical entailment of this conjunction is immediate and devastating. From (P1) and (P2), we conclude that quantum objects are incomplete. From this conclusion and (P3), we are forced to conclude:

- **Conclusion (C):** Standard quantum-mechanical objects (electrons, cats, observers' brains) are nonexistent.

This conclusion, as A&V correctly note, is empirically false and ontologically catastrophic. It contradicts the very experimental data (e.g., interference patterns) that necessitate the postulation of quantum objects in the first place [3, p. 16].

1.4 The A&V Solution: The Rejection of P3

Faced with this *reductio*, A&V must reject one of the premises. They rightly accept (P1) as the datum provided by science. The choice is thus between (P2) and (P3). Their solution is to reject (P3), the IENP.

By jettisoning (P3), they propose a "modified" Meinongianism—one in which the class of *existing* objects can now be bifurcated into complete (classical) objects and incomplete (quantum) objects. This move resolves the paradox. It allows them to maintain that quantum objects are indeterminate (P1), that this indeterminacy *is* incompleteness (P2), but that this incompleteness no longer entails nonexistence. They thus conclude that quantum objects are a novel ontological class: "existent, but incomplete objects" [3, p. 15].

1.5 The Thesis of This Article: A Categorial Error in P2

This article argues that the A&V solution, while internally consistent, is a profound philosophical error born from a misapplication of the metaphysical instrument. Their diagnosis targets the wrong premise. The fatal flaw in the trilemma is not (P3), but the unexamined "bridge thesis" (P2) that equates QI and MI.

Our counter-argument is that (P3) is not an expendable feature of Parsons' system; it is a load-bearing, defining principle that codifies the very distinction between *existentia* and *non-existentia*. To reject (P3) is not to "modify" the tool, but to break it.

The real error is (P2), which commits a subtle but severe categorial fallacy. This article will demonstrate that Quantum Indeterminacy and Meinongian Incompleteness are fundamentally incommensurable concepts:

1. **Quantum Indeterminacy (QI)** is not an *absence* of properties. It is the *presence* of a positive, non-classical, and ontologically *complete* state (the vector state $|\psi\rangle$), which simply fails to map onto a classical, Boolean (true/false) property-ascription. Its reality is confirmed by its unique causal efficacy (i.e., its ability to produce interference, a phenomenon impossible for either of its definite-valued components).

2. **Meinongian Incompleteness (MI)** is, by contrast, a true *ontic gap*. It is a *definitional absence* of information. The object "the golden mountain" is not in a superposition of "being in North America" and "not being in North America"; it is an object whose defining nuclear properties simply do not include that predicate. It is defined by its lack.

A&V's error is to mistake the failure of a classical property-ascription (in QI) for an absence of being (in MI). In doing so, they have selected a metaphysical tool designed for the analysis of *fictionalia* and *abstracta* and misapplied it to *physica*.

1.6 Structure of the Argument

This article will proceed as follows. Section 2 will conduct a rigorous conceptual analysis of QI, focusing on superposition and contextuality, to establish its status as an ontologically complete, positive state. Section 3 will perform a parallel analysis of Parsons' MI, arguing that its function as a "definitional absence" is essential and distinct. Section 4 will defend P3 (IENP) as constitutive of the Parsonsian project, arguing that its rejection renders the framework incoherent as a metaphysics of existence. Section 5 will conclude that the A&V project fails not because metaphysics is impotent, but because the specific "tool" chosen was categorically inappropriate for the task.

2 Conceptual Analysis: Two Types of 'Non-Definiteness'

The central argument of this paper hinges on the demonstration that Premise P2 of the A&V trilemma—the "bridge thesis" equating Quantum Indeterminacy (QI) with Meinongian Incompleteness (MI)—is a fundamental categorial error. The conflict identified by Arroyo and Valvassori (A&V) [3] is not a sign that the IENP (Premise P3) must be sacrificed, but rather that the chosen metaphysical "instrument" is ontologically unfit for the task. To substantiate this claim, a rigorous, independent conceptual dissection of the two categories, MI and QI, is required. This section will demonstrate that MI is an *ontic lacuna* (a deficiency of being), whereas QI is an *ontic plenum* (a complete, albeit non-classical, mode of being).

2.1 The Ontology of Meinongian Incompleteness (MI) in Parsons

The meta-ontology developed by Terence Parsons [8] is a sophisticated attempt to formalize discourse about non-existent objects, avoiding the Russellian paradoxes that plagued earlier Meinongian systems. The concept of "incompleteness" is central to this framework, but its technical meaning must be precisely understood.

2.1.1 The Nuclear vs. Extra-Nuclear Distinction

The viability of Parsons' system rests on a fundamental distinction between two classes of properties.

- **Nuclear Properties:** These are the "characterizing" properties that constitute the *whatness* of an object. They are the ordinary predicates of figment and fact: 'being blue', 'being a mountain', 'being golden', 'being a wizard' [3, p. 10]. Parsons posits that for any set (or "nucleus") of such properties, there is a corresponding object that has *exactly* those nuclear properties [3, p. 10].
- **Extra-Nuclear Properties:** These properties are "metaphysical," technical, or modal. They do not characterize the object itself, but rather its *ontological status*. This class includes 'being existent', 'being nonexistent', 'being fictional', 'being possible', 'being thought about by someone', and—critically for this analysis—'being complete' or 'being incomplete' [3, p. 10].

This distinction is what allows Parsons to defuse Russell's paradox of the "existent round square." The object *has* the nuclear properties 'round' and 'square' but *lacks* the extra-nuclear property 'existence'. The IENP (P3) is a statement *about* this framework: it is the explicit assertion that the extra-nuclear property 'being existent' necessitates the (also extra-nuclear) property 'being complete'.

2.1.2 MI as a Definitional Lacuna

Parsons' definition of "completeness" is precise: "an object... has either that property or it has its negation" for *any* nuclear property [3, p. 10]. Incompleteness, therefore, is the failure to satisfy this condition.

This "incompleteness" is a direct consequence of the object-comprehension principle. Consider the object defined by the nucleus {golden, mountain}. This object *has* the property 'golden' and *has* the property 'mountain'. But what of the property 'blue'? The nucleus does not contain 'blue'. Nor does it contain 'not-blue'. Because the object is defined *only* by the properties in its

nucleus, it is *neither* blue *nor* not-blue. It is, as Parsons states, "indeterminate with respect to blueness" [3, p. 10].

This is not a state of vagueness or epistemic uncertainty. It is a **definitional lacuna**. The property is simply absent from the object's formal definition. The object is "gappy" with respect to all properties not explicitly included in (or entailed by) its nucleus.

2.1.3 MI as an Ontic Gap

The philosophical implication of 2.1.2 is that MI constitutes a true *ontic gap*, a "hole in being." To use the example of Gandalf, the text (the object's "definition") specifies that he is 'a wizard' and 'inhabits Middle-earth' [3, p. 9]. It does not, however, specify the exact number of hairs on his head.

Consequently, there is *no fact of the matter* about whether Gandalf has 100,000 hairs or not-100,000 hairs [3, p. 9]. This "indeterminacy" is a pure *deficiency*. It is a logical and ontological *absence*. This gappy, deficient nature of MI is precisely what makes it a plausible model for fictionalia, but, as we shall see, a deeply implausible one for *physica*. Crucially, this ontic gap is causally inert; Gandalf's lack of a hair-count has no empirical consequences within his fictional world.

2.2 The Ontology of Quantum Indeterminacy (QI)

We now turn to the physical concept of quantum indeterminacy. A&V's P2 thesis rests on the claim that this, too, is a form of "incompleteness." This subsection argues that, on the contrary, the standard interpretation of quantum mechanics describes an ontology that is not *less* complete than classical ontology, but *differently* and perhaps *more* complete.

2.2.1 The Completeness of the State Vector

The foundational premise of the standard (non-hidden-variable) interpretation of quantum mechanics is that the state vector $|\psi\rangle$ (or "wave function") provides a *complete and exhaustive description* of the physical system [1]. The indeterminacy that arises from the formalism is therefore not epistemic (a lack of knowledge about an underlying definite state) but ontological (an objective feature of reality).

This immediately establishes a critical disanalogy with MI. The Meinongian object is, by definition, incompletely specified. The quantum object is, by postulate, completely specified by its state vector. The error of P2, therefore, is to confuse "a complete specification of an indeterminate state" (QI) with "an incomplete specification" (MI).

2.2.2 QI as a Positive, Non-Classical State (Superposition)

What, then, is the ontological nature of a superposition state, such as $|\psi\rangle = \alpha|A\rangle + \beta|B\rangle$ (where $|A\rangle$ and $|B\rangle$ are determinate states, e.g., 'ball in box A' and 'ball in box B') [3, p. 4]?

The Meinongian (MI) reading would be that the object is "neither A nor not-A" (a gap). The quantum (QI) reality is profoundly different. The superposition state is a *positive, definite, existing state* in a non-classical state space (Hilbert space). It is a specific vector with a definite orientation. Bloch sphere for a qubit showing superposition The states 'spin-up' ($|z+\rangle$) and 'spin-down' ($|z-\rangle$) are the North and South poles, respectively. A particle in a superposition of spin-up and spin-down is *not* "nowhere" on the sphere, nor is its state "gappy." It is at a *definite point* on the sphere's equator (e.g., $|x+\rangle = \frac{1}{\sqrt{2}}(|z+\rangle + |z-\rangle)$). This state is just as "real" and "complete" as the pole-states; it is simply indeterminate with respect to the z-axis basis. This is not an absence of being, but the presence of a different being.

2.2.3 The Causal Efficacy of Indeterminacy

The most powerful argument against P2 is the experimental one, which A&V themselves use to reject P3 [3, p. 15]. The causal efficacy of interference phenomena provides definitive proof of the reality and positivity of the superposition state.

- **MI (Ontic Gap):** As established in 2.1.3, the "indeterminacy" of Gandalf's hair-count is a causally inert *absence*. It does nothing.
- **QI (Superposition):** In a double-slit experiment, an electron's state is a superposition of $|\text{path A}\rangle + |\text{path B}\rangle$. This "indeterminate" state is the *very thing* that has the causal power to interact with *itself*, producing the interference pattern on the detector screen [1].

A&V state that "Interference grants existence" [3, p. 16]. This is correct, but the implication is not merely that the electron exists. The implication is that the *superposition state itself* exists and is causally potent. It is not an "incompleteness" (a lack) but a *positive, active physical state* that defines the system's behavior.

2.2.4 QI and Contextuality (The Kochen-Specker Theorem)

A&V correctly identify the Kochen-Specker (KS) theorem as a deeper, structural source of indeterminacy, independent of superposition [3, p. 6]. However, they fail to analyze *what kind* of indeterminacy it implies.

The KS theorem proves the impossibility of assigning *globally* consistent, non-contextual, pre-measurement definite values to all observables [5, 9]. This is, again, profoundly different from MI.

- **MI** states: Object *O* lacks a fact about property *P*. It is a statement about a *single object* and a *single property*.
- **KS** states: It is impossible to assign values $v(A), v(B), v(C), \ldots$ to all properties of system *S* such that the functional relationships between them are preserved (e.g., $v(A^2) = v(A)^2$) independent of the context of measurement.

The KS theorem does not describe a "gappy" object. It describes an object whose properties are *holistically constrained* and contextually defined. It reveals that properties are not a collection of independent, possessed "values" (as in classical substance-property metaphysics) but rather a relational structure. Once again, this is not an ontology of deficiency or absence, but an ontology of *complex, non-classical structure*.

The analysis of this section concludes that P2 is false. MI and QI are not only non-equivalent; they are conceptual and ontological opposites. MI is defined by a causally inert absence of information. QI is defined by the presence of a causally potent, complete, non-classical state.

3 Critique of Premise P2: The Argument from False Equivocation

The conceptual analysis conducted in Section 2, which distinguished the *ontic plenum* of Quantum Indeterminacy (QI) from the *ontic lacuna* of Meinongian Incompleteness (MI), provides the necessary foundation for a direct critique of the A&V trilemma. The entire *reductio* constructed by Arroyo and Valvassori (A&V) [3] rests on the load-bearing capacity of Premise P2, their "bridge thesis" which asserts the conceptual equivalence of QI and MI [3, p. 14]. If this premise fails, their argument that we must reject P3 (the IENP) collapses. This section will demonstrate not only that P2 is false, but that it is a clear instance of a false equivocation, conflating two distinct and incompatible ontological categories.

3.1 MI $\neq$ QI: The Categorial Mismatch

The simplest formulation of our critique is to restate the conclusion of Section 2: the two concepts are fundamentally dissimilar.

- **Meinongian Incompleteness (MI)** is a **negative** concept. It signifies an *absence of fact* or a *definitional gap*. The object is "gappy" because its defining nucleus is silent on a given property P. It lacks both P and $\neg P$.
- **Quantum Indeterminacy (QI)** is a **positive** concept. It signifies the *presence of a non-classical fact*. The system is in a definite, complete state $|\psi\rangle$ that is simply not an eigenstate of the observable in question. This state (e.g., superposition) is a positive, causally active feature of reality, not a "gap" in it.

A&V's attempt to map one onto the other is a categorial error. It is like equating an empty database field (MI) with a database field that contains a complex, non-binary value (QI). The *reductio* they identify is not a paradox in metaphysics, but a predictable logical contradiction arising from the initial misapplication of the Parsonsian tool.

3.2 The Argument from Ontological Completeness

A formal argument can be constructed from the opposed notions of "completeness" in each system.

1. In standard (non-hidden-variable) quantum mechanics, the state vector $|\psi\rangle$ is posited to be an *ontologically complete* description of the physical system. Nothing further can be said about the system because there is nothing further *to* say.
2. In Parsons' Nuclear Meinongianism, an "incomplete" object is, *by definition*, *ontologically incomplete*. It is an object for which, with respect to at least one nuclear property P, it has neither P nor its negation [3, p. 10].
3. An object cannot be both ontologically complete (as per premise 1) and ontologically incomplete (as per premise 2) with respect to the same set of properties. The two descriptions are mutually exclusive.
4. **Therefore:** A quantum object, as described by standard QM, cannot be a Meinongian incomplete object, as defined by Parsons.

Premise P2, which asserts this very identity, is therefore demonstrably false. A&V's argument [3, p. 14] hinges on the belief that both systems describe "indeterminacy," but they fail to see that one system defines this as a complete, positive state while the other defines it as a negative, "gappy" state.

3.3 The Argument from Causal Efficacy

A second, independent argument against P2 comes from the empirical domain: the profound difference in causal power between QI and MI.

- **The Causal Inertness of MI:** The incompleteness of a Meinongian object is, by its very nature, causally inert. Gandalf's lack of a specific hair count [3, p. 9] or "the golden mountain's" lack of a determinate location [3, p. 10] are *pure absences*. They have no physical or logical consequences. This lack does not *do* anything; it is simply a feature of a sparse definition.

- **The Causal Potency of QI:** Quantum indeterminacy, in stark contrast, is one of the most causally potent features of the physical world. As A&V themselves correctly observe, it is the electron's "indeterminate" superposition state that is the causal source of the double-slit interference pattern [3, p. 15]. This state is not an absence of properties but a positive state with unique causal powers that its determinate-valued components ($|\text{slit A}\rangle$ and $|\text{slit B}\rangle$) lack in isolation. The "indeterminacy" of the state $|\psi\rangle$ is the *very reason* for the observable, empirical phenomenon of interference.

This constitutes a decisive disanalogy.

1. A state of QI is causally efficacious and empirically verifiable (e.g., via interference) [3, p. 15, 16].
2. A state of MI is, by definition, a causally inert ontic gap.
3. Causally efficacious states and causally inert states are not ontologically equivalent.
4. **Therefore:** QI and MI are not equivalent. P2 is false.

A&V use the empirical fact of interference to reject P3 (IENP) [3, p. 16]. Their argument is: "Interference grants existence; therefore, the object is not non-existent." A more precise and rigorous conclusion would have been: "Interference grants existence *to the superposition state itself*; this state is a positive, causally active phenomenon; this is the ontological opposite of a causally inert, negative 'gap' (MI); therefore, P2 is false." They identified the correct evidence but aimed it at the wrong logical target.

3.4 Locating the Equivocation in A&V's Argument

The precise moment of conceptual error in the A&V paper can be located in their reasoning on page 14. They first cite Lewis's (2016) definition of metaphysical indeterminacy: "an object has a determinable property, but no determinate value for that determinable" [3, p. 14]. This is a fair characterization of QI.

They then cite Parsons' (1980) definition of a "complete" object: one that "has either that property or it has its negation" [3, p. 14]. This defines MI (as the failure of this condition).

Their fatal move is to assert that these two descriptions "fit the situation" [3, p. 14]. They perform a logical substitution, equating:

$$(\text{lacking a } \textit{determinate value}) \equiv (\text{lacking } \textit{the property or its negation})$$

This is a false equivocation.

- A quantum object in a superposition state *has* the determinable property (e.g., "position," "spin-in-z-direction"). It possesses this property in a definite, complete way, described by the state vector $|\psi\rangle$. This state itself is a property, just not a *determinate* (eigenstate) one. The state's positive nature *precludes* it from having one of the classical determinate values.
- A Meinongian object, by contrast, *lacks* the property at the nuclear level. The object "the golden mountain" does not "have" the property "location-in-America" in an indeterminate way; its nucleus is simply *silent* on the matter. It is not in a positive state that precludes a determinate value; it is in a negative state of definitional absence.

A&V's argument conflates a *non-classical possession* of a property with a *classical absence* of one. Having established this equivocation as the true source of the paradox, the logical force of the *reductio* is entirely redirected. It no longer challenges P3 (IENP) but instead serves as a powerful refutation of P2.

4 Re-evaluating the Trilemma: Why P3 (IENP) is Consequential

The preceding sections have established that Premise P2 of the A&V trilemma is false, as it rests on a fundamental categorial error. This alone is sufficient to dissolve their paradox and nullify their conclusion. However, their proposed solution—the rejection of Premise P3, the Incompleteness-Entails-Nonexistence Principle (IENP)—demands its own critical analysis. It is not merely that the rejection of P3 is *unnecessary* (because P2 was the true culprit); it is that this move is *destructive* to the very metaphysical framework A&V sought to employ. This section will argue that P3 is not an ancillary or disposable feature of Parsons' system, but a load-bearing, constitutive principle, the removal of which renders the "instrument" itself incoherent for its intended purpose.

4.1 IENP as the "Metaphysical Firewall"

In the architecture of Parsons' Nuclear Meinongianism, the IENP is not a minor stipulation. It functions as the central "metaphysical firewall" that polices the fundamental divide between the two domains of objects the theory is designed to handle. Parsons' (1980) entire project is to provide a formal semantics for discourse about non-existent objects (*non-existentia*) without violating the principle of non-contradiction or granting them a problematic ontological status [8].

The distinction between nuclear and extra-nuclear properties provides the technical apparatus, but it is the IENP that gives this apparatus its primary sorting power. The principle effectively partitions the total domain of objects into two mutually exclusive realms:

- **The Domain of Existence (*res extensa*):** This is the domain of physical reality. Parsons, honoring the classical metaphysical intuition, stipulates that any object admitted into this domain must have the extra-nuclear property 'existence', and this, in turn, *necessitates* that it also has the extra-nuclear property 'completeness'.
- **The Domain of Non-Existence (*res ficta*, *abstracta*):** This is the domain of fiction, logic, and intentional objects. Objects here are defined by the extra-nuclear property 'non-existence'. This domain serves as the "quarantine" for ontological peculiarities, most notably, *incompleteness*. An object like "the golden mountain" [3, p. 10] or "Gandalf" [3, p. 9] can be incomplete *precisely because* it is non-existent.

Thus, the IENP is the very principle that separates the ontology of physics from the ontology of fiction. It is the core commitment that allows Parsons to discuss "Gandalf" without ontologically equating him with "an electron."

4.2 The Classical Intuition of Plenitude

The motivation for this "firewall" is not arbitrary. The IENP is Parsons' formal encoding of a deep and pervasive metaphysical intuition about the nature of concrete reality. This is the intuition of *ontological plenitude*: that to *exist*—to be a spatiotemporal entity in the causal matrix of the world—is to be fully determinate in all respects. As A&V themselves note, this is the "natural view" articulated by philosophers like Armstrong (1961), who asserts that every physical object "has a perfectly precise colour, temperature, size, etc." [3, p. 5].

The classical view holds that reality cannot contain "gaps" or "holes" of the Meinongian variety. An existing, physical object cannot be "neither P nor ¬P." It may be in a state we find difficult to describe (as in QI), but it cannot be *definitionally deficient* (as in MI). Parsons' IENP is designed to *protect* this intuition for the existing world (*res extensa*) while simultaneously licensing discourse about the "gappy" objects of thought and fiction (*res ficta*).

4.3 The Destruction of the Instrument

When A&V propose to "jettison IENP" [3, p. 18], they are not performing a minor "modification" [3, p. 17] to the Meinongian tool. They are, in fact, demolishing its central load-bearing wall.

By advocating for "existent, but incomplete objects" [3, p. 15], they collapse the very distinction that the Parsonsian framework was engineered to uphold. The "firewall" is breached. If an electron (an existing object) can now be "incomplete" in the Parsonsian sense, the category of "incompleteness" no longer serves to distinguish it from Gandalf (a non-existing object). Both are now simply "incomplete," with existence demoted to just another property on a list, rather than a status-conferring meta-property.

This "modified" tool is no longer a useful instrument for metaphysics. It has lost its power to differentiate the ontology of physics from the ontology of fiction. A&V's move, far from being a "naturalistic" concession to science [3, p. 2], is a far more radical and metaphysically unpalatable step than they acknowledge. It results in a flat, muddled ontology where the fundamental differences between the causal, complete reality of physics and the gappy, defined reality of fiction are erased. The instrument is not "modified"; it is rendered unfit for its original purpose.

5 Conclusion: The Perils of an Uncritical 'Toolbox' Application

This paper has critically analyzed the argument presented by Arroyo and Valvassori (A&V) [3]. While their work correctly identifies a profound logical conflict between the ontology of standard quantum mechanics and the meta-ontology of Parsons' Nuclear Meinongianism [8], their diagnosis of this conflict, and their proposed remedy, are fundamentally in error.

5.1 Restatement of the Thesis

A&V construct a trilemma from (P1) Quantum Indeterminacy, (P2) the Bridge Thesis equating QI with Meinongian Incompleteness (MI), and (P3) the IENP. The resulting *reductio* (that quantum objects are non-existent) leads them to reject P3.

This paper has argued, conversely, that the conflict identified by A&V should be interpreted as a classic *reductio ad absurdum* of Premise P2, the "bridge thesis." The contradiction does not arise from a clash between science (P1) and a disposable metaphysical dogma (P3). It arises from a fundamental categorial error (P2) in which two ontologically incommensurable concepts—the *positive, complete, non-classical state* of QI and the *negative, gappy, definitional absence* of MI—were falsely equated. The A&V paradox is not a reason to modify Parsons' system; it is a definitive proof of its non-applicability to this specific scientific domain.

5.2 The Ontological Verdict

The final verdict on the "Toolbox" application [3, p. 2] of Parsonsian metaphysics to quantum mechanics is one of categorical inappropriateness. Parsons' Nuclear Meinongianism [8] remains a powerful and elegant framework for its intended domain: the formal analysis of intentionality, the semantics of fictional discourse, and the meta-ontology of abstracta. Its conceptual machinery is precision-engineered to handle objects defined by *ontic lacunae*.

Physical reality, as described by quantum mechanics, is not a domain of lacunae. It is a *plenum*. Quantum indeterminacy, as manifested in superposition and contextuality, is not a "gap" in being but a *different structure* of being—one that is non-classical, holistic, and complete in its own terms, as evidenced by its causal efficacy [3, p. 16]. Parsons' tool is simply the wrong instrument for the job, as it is ontologically mismatched to the very phenomenon it was brought in to explain.

5.3 The Metametaphysical Lesson

The A&V case study serves as a crucial methodological cautionary tale for the "Toolbox Approach" to the metaphysics of science [4]. The approach, which advocates for a productive engagement between scientific findings and extant metaphysical theories, carries an inherent risk: the risk of uncritical application.

Before a metaphysical "instrument" can be fruitfully applied to a scientific concept, a rigorous "conceptual compatibility check" must be performed. A&V, in their enthusiasm to find a tool for indeterminacy, seized upon Parsons' framework without first demonstrating that "incompleteness" (MI) and "indeterminacy" (QI) were commensurable. The *reductio* they produced should have served as the negative result of this compatibility check, signaling that the tool was inappropriate. Instead, they interpreted it as a mandate to "fix" the tool, a move that, as argued in Section 4, effectively destroys the tool's core function.

The lesson is one of methodological rigor. The traffic between science and metaphysics must be two-way, but it must also be critical. A failed application does not always necessitate a revision of the metaphysical theory; it may, as in this case, simply reveal that the wrong theory was chosen. Quantum Indeterminacy is not Meinongian Incompleteness.

References

[1] Albert, David Z. (1992). *Quantum mechanics and experience*. Harvard University Press, Cambridge.

[2] Armstrong, David M. (1961). *Perception and the physical world*. Routledge, London.

[3] Arroyo, Raoni and Renato Semaniuc Valvassori (2025). "Incomplete yet existent objects: a Nuclear Meinongian approach to quantum metaphysical indeterminacy". Forthcoming in *Principia*.

[4] French, Steven and Kerry McKenzie (2012). "Thinking Outside the Toolbox: Towards a More Productive Engagement Between Metaphysics and Philosophy of Physics". *European Journal of Analytic Philosophy*, **8**, 1, pp. 42–59.

[5] Kochen, Simon and E. P. Specker (1967). "The Problem of Hidden Variables in Quantum Mechanics". *Journal of Mathematics and Mechanics*, **17**, 1, pp. 59–87.

[6] Lewis, Peter J. (2016). *Quantum Ontology*. Oxford University Press, New York.

[7] Maudlin, Tim (2019). *Philosophy of Physics: Quantum Theory*. Princeton University Press, Princeton.

[8] Parsons, Terence (1980). *Nonexistent objects*. Yale University Press, New Heaven.

[9] Peres, Asher (1991). "Two simple proofs of the Kochen–Specker theorem". *Journal of Physics A: Mathematical and General*, **24**, 4, pp. L175–L178.

[10] Reicher, Maria (2022). "Nonexistent Objects". In *The Stanford Encyclopedia of Philosophy*, ed. by Edward N. Zalta and Uri Nodelman. Metaphysics Research Lab, Stanford University.

[11] Zalta, Edward N. (1983). *Abstract Objects: An Introduction to Axiomatic Metaphysics*. D. Reidel Publishing Company, Dordrecht.