PREPRINT

Residual Empiricism and the Bearer of Scientific Acceptance

From Empirical Adequacy to Objectivating Adequacy

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Abstract. Constructive empiricism restricts the belief involved in scientific acceptance: to accept a theory is not to believe that it is true, but only that it is empirically adequate. I argue that this restriction is correct but incomplete. It restricts the doxastic force of acceptance, while leaving its bearer at the level of whole theories. Drawing on van Fraassen's semantic conception of theories, his later account of scientific representation, measurement, and perspective, and his conception of empiricism as a stance rather than a factual thesis, I argue that acceptance should instead be directed at classes of objectivating content: contents stable across admissible formulations, models, mediations, measurements, and uses. Such a view yields a residual empiricism that is stronger than mere empirical adequacy, because it requires public objectivation, but weaker than scientific realism, because objectivating adequacy does not entail ontological commitment. The argument is situated against debates on scientific realism, selective realism, structural realism, robustness, and scientific representation.

Keywords: constructive empiricism; scientific realism; van Fraassen; empirical adequacy; empirical stance; scientific acceptance; scientific representation; measurement; robustness; perspective; objectivation.

This is a preprint. Comments are welcome.

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1. Introduction: The Bearer Problem for Scientific Acceptance

Constructive empiricism is usually presented as a restriction on belief. To accept a scientific theory is not to believe that the theory is true, but only that it is empirically adequate. Van Fraassen's canonical formulation is explicit: "Science aims to give us theories which are empirically adequate" (van Fraassen, 1980, p. 12). Such a restriction does not turn scientific theories into mere instruments. Van Fraassen's empiricism remains literalist: theories are "the sort of thing which can be true or false" (van Fraassen, 1991, p. 3). Disagreement with scientific realism therefore does not concern whether theoretical discourse has truth-conditions, but what attitude scientific acceptance rationally requires toward the theory so understood.

My claim is that this restriction is correct but incomplete. Constructive empiricism separates acceptance from belief in the truth of the whole theory; it does not sufficiently refine the bearer of acceptance itself. In the standard formulation, the theory still functions as the primary unit to be accepted: one accepts a theory T, while believing only that T is empirically adequate. Doxastic force is restricted, yet the object of acceptance remains theory-level. A more basic question is therefore left unresolved: what, within a scientific theory, is actually accepted when the theory is used, trusted, corrected, projected, and retained without being believed as true?

Familiar pressures on theory-level realism make this question unavoidable. The pessimistic induction suggests that the success of past theories does not license a direct inference to their approximate truth as wholes (Laudan, 1981). Structural realism relocates continuity from entities to structure, but still raises the question of what kind of structure is the legitimate bearer of realist commitment (Worrall, 1989). Selective realism and semi-realism attempt to identify those components of successful science that deserve realist treatment, while leaving the relevant unit contested: theory, entity, structure, property, model, or something more fine-grained (Psillos, 1999; Chakravartty, 2007). In empiricist terms, the same allocation problem reappears. If the realist must determine what receives realist credit, the empiricist must determine what receives scientific acceptance.

Nor is the problem external to van Fraassen's framework. It arises from three features of his own philosophy of science. First, the semantic conception of theories already differentiates the theory internally. If a theory is not primarily a set of sentences but a class of models, then it cannot be treated as a flat object of acceptance. Van Fraassen rejects the idea that a theory must be divided into pure syntax plus an interpretation which confers meaning on it (van Fraassen, 1991, p. 8). He also insists that only certain parts of models function as empirical substructures, namely the candidates for representing the observable phenomena with which science is confronted (van Fraassen, 1989, p. 226). Empirical adequacy is then characterized by the embeddability of those empirical structures into a model allowed by the theory (van Fraassen, 1989, p. 227). Once empirical adequacy depends on selected structures and their relation to phenomena, the whole theory becomes too coarse to be the precise bearer of acceptance.

A second pressure comes from van Fraassen's later account of scientific representation. In *Scientific Representation*, representation is not exhausted by theories or theoretical models. Scientific representation proceeds by means of concrete and abstract artifacts, such as graphs, scale models, computer displays, and mathematical models, while its use is mediated by measurement and experimentation (van Fraassen, 2008, pp. 1–3). Measuring is itself a form of representing: it locates a target in a theoretically constructed logical space rather than mirroring it. This later account sharpens the bearer problem. Once representation is distributed across theories, models, instruments, measurement procedures, perspectives, and uses, acceptance cannot be adequately allocated to the theory as an undifferentiated whole. The point also

connects the present argument with contemporary debates on scientific representation, where resemblance, isomorphism, inferential use, denotation, and model-target relations have been treated as insufficient unless embedded in a broader account of representational practice (Suárez, 2003; Frigg and Nguyen, 2020).

A third feature is van Fraassen's conception of empiricism as a stance rather than as a factual doctrine. In *The Empirical Stance*, he argues that empiricism should not be reconstructed as a thesis about what the world is like. It is better understood as a stance: a disciplined orientation involving commitments, refusals, policies of inquiry, and resistance to certain metaphysical demands (van Fraassen, 2002, pp. 48–49, 61–63). For the present proposal, this point is decisive. Residual empiricism is not a new metaphysical thesis according to which only objectivating contents exist. It is a stance governing the allocation of scientific acceptance. It specifies what scientific acceptance commits us to, and where the further transition to ontological commitment must be suspended.

Accordingly, the guiding claim of this paper can be stated as follows: constructive empiricism restricts the doxastic force of scientific acceptance, but leaves the bearer of acceptance insufficiently discriminated. Once theories are understood semantically, once scientific representation is understood as model-mediated, instrumentally mediated, perspectival, and measurement-involving, and once empiricism is understood as a stance rather than as a factual thesis, acceptance should not be directed at whole theories. It should be directed at classes of objectivating content: contents that remain identifiable across admissible formulations, models, mediations, measurements, and uses, and that publicly support the identification, stabilization, correction, and projective reuse of phenomena.

From this shift follows a residual empiricism. The view remains empiricist because it does not infer from scientific acceptance to belief in the truth of a theory, nor from successful objectivation to ontological commitment. It is residual because the accepted item is not the whole theory, the whole model, an isolated sentence, or a theoretical entity, but a selected class of content stabilized under scientific constraints. The relevant transition is therefore not:

$$\mathrm{Accept}(T) \Rightarrow \mathrm{Believe}(\mathrm{True}(T)),$$

but rather:

$$\mathrm{Accept}^{S,\Pi}_{RE}([C]) \Rightarrow \mathrm{Believe}\big(\mathrm{ObjAdeq}_{S,\Pi}([C])\big).$$

Here $[C]$ denotes a class of content selected under a scientific regime S and a local profile Π. ObjAdeq denotes objectivating adequacy: the capacity of that content to sustain the public objectivation of a phenomenon. Such belief is stronger than mere confidence that observations can be saved, because it concerns stabilized scientific content; yet it remains weaker than realism, because it does not assert that the content is ontologically grounded as a constituent of the world.

Far from being a disguised realism, the resulting position blocks precisely the automatic inference from objectivating success to ontology. The realist may object that if a content is stable across admissible formulations, robust under correction, and projectively reusable, then it should be treated as revealing something real. Residual empiricism denies that this inference is automatic. Van Fraassen's analysis of representation already blocks any direct transition from successful representation to resemblance, and still more from representational success to ontology: representations are governed by purposes, media, selectivity, distortion, and criteria of adequacy (van Fraassen, 2008, pp. 7–15). His stance-based account of empiricism reinforces the same point at the level of philosophical attitude: the empiricist need not deny that realist interpretations can be proposed; the empiricist denies that they are required by scientific

acceptance itself (van Fraassen, 2002, pp. 48–49, 61–63). Objectivating adequacy warrants acceptance of a content as a public scientific unit; it does not by itself warrant belief in its ontological truth.

2. Constructive Empiricism: Literalism Without Global Belief

2.1. Rejecting instrumentalism

Constructive empiricism should not be understood as a return to instrumentalism. Its central restriction concerns belief, not meaning. Theories are not treated as mere devices for prediction, calculational fictions, or abbreviations for observable regularities. They are taken literally: their theoretical claims are meaningful, truth-evaluable, and directed at the world as described by the theory. Van Fraassen is explicit on this point when he writes that theories are "the sort of thing which can be true or false" (van Fraassen, 1991, p. 3). Empiricist disagreement with realism therefore does not begin with a semantic deflation of theoretical discourse. It begins with a restriction on the belief that scientific acceptance requires.

Precisely here lies the decisive point. Were constructive empiricism merely instrumentalist, its contrast with realism would concern the status of theoretical language itself: the realist would take theoretical claims literally, while the empiricist would treat them as useful instruments. Van Fraassen blocks that division. Theoretical discourse is not stripped of content. Claims about electrons, fields, quantum states, forces, symmetries, or model structures are not reinterpreted as shorthand for observations. They remain claims that may be true or false. What is denied is the inference from accepting a theory to believing that the theory is true.

One may therefore describe the resulting view as literalism without global belief. It is literalist because theories say something about the world and are not reduced to their observable consequences. It is not globally realist because accepting a theory does not require believing that the world is as the theory says in all respects, including its unobservable structure. Theories retain semantic seriousness without thereby acquiring unrestricted doxastic authority.

Nor should this position be confused with generalized skepticism about theoretical entities. Constructive empiricism does not assert that electrons, fields, genes, quantum states, or other theoretical posits do not exist. Such a claim would itself be a substantive metaphysical denial. Rather, the constructive empiricist maintains that science, as a practice of theory acceptance, does not require belief in their existence. Suspension of required belief is not negation. The empiricist position is one of doxastic economy, not ontological eliminativism.

2.2. Acceptance and restricted belief

Van Fraassen's answer is well known: to accept a theory is to believe that it is empirically adequate. Within constructive empiricism, the aim of science is not to give us true theories, but empirically adequate ones (van Fraassen, 1980, p. 12). This should not be read as a psychological thesis about the motives of scientists, nor as a metaphysical teleology attributed to science as a unified agent. It specifies a norm of scientific acceptability. A theory need not be believed true in order to be accepted; it must be believed adequate with respect to the observable phenomena it purports to save.

Logically, the structure is simple:

$$\mathrm{Accept}(T) \Rightarrow \mathrm{Believe}(\mathrm{EmpAdeq}(T)), \qquad \mathrm{Accept}(T) \not\Rightarrow \mathrm{Believe}(\mathrm{True}(T)).$$

Acceptance has a doxastic component, but this component is restricted. The belief required is not belief in the truth of T, but belief in its empirical adequacy. A true theory would be empirically adequate, but an empirically adequate theory need not be true:

$$\text{True}(T) \Rightarrow \text{EmpAdeq}(T), \qquad \text{EmpAdeq}(T) \not\Rightarrow \text{True}(T).$$

From this asymmetry constructive empiricism derives its exact logical form. Truth entails empirical adequacy; empirical adequacy does not entail truth. Scientific acceptance therefore licenses a weaker doxastic attitude than realism requires.

Crucially, the distinction between acceptance and belief is not an incidental addition to the doctrine. Van Fraassen states it directly: "I conclude that acceptance is not belief" (van Fraassen, 1991, p. 3). This does not mean that acceptance contains no belief at all. The point is more precise: acceptance is not identical with belief in the truth of the accepted theory. Acceptance includes a minimal belief, namely belief in empirical adequacy, and it also includes practical commitments: using the theory, relying on its models, classifying phenomena in its terms, pursuing research within its framework, and constructing experiments under its guidance.

Such a structure avoids two opposed distortions. Against instrumentalism, constructive empiricism preserves the literal and truth-evaluable character of theoretical discourse. Against realism, it denies that literal acceptance requires belief in the truth of the theory. The correct contrast is therefore not:

realist meaning versus instrumental utility,

but:

literal content with global belief versus literal content with restricted belief.

2.3. Empiricism as stance rather than thesis

Van Fraassen's later conception of empiricism as a stance gives the restriction of belief a broader setting. In *The Empirical Stance*, he argues that empiricism cannot be reduced to a single factual thesis without becoming vulnerable to the very metaphysical ambitions it resists. If empiricism were defined by a doctrine such as a thesis about what there is, what is knowable, or what the world is fundamentally like, it would become one more philosophical posit requiring the same sort of support as the metaphysics it opposes. The empiricist alternative is to understand empiricism as an attitude or stance: a pattern of commitments, refusals, values, and policies of inquiry (van Fraassen, 2002, pp. 48–49).

For the present argument, this stance-based conception is not peripheral. Residual empiricism should not be read as the thesis that the world contains only objectivating contents, or that contents without objectivating adequacy are unreal. Such claims would be metaphysical theses. Residual empiricism is instead a discipline of acceptance. It says that scientific acceptance, as such, commits us to objectivatingly adequate contents, and that any further realist interpretation requires an additional argument.

A compact contrast clarifies the point:

doctrinal empiricism: a thesis about what the world is like;
residual empiricism: a stance regulating what scientific acceptance commits us to.

With this distinction in place, a common misunderstanding disappears. Residual empiricism is not a negative ontology. It does not assert that unaccepted or unobjectivated items do not exist. It regulates the

transition from scientific practice to commitment. Its primary question is not "What exists?" but "What does scientific acceptance require?"

2.4. Initial gain, residual problem

Constructive empiricism first gains precision by restricting doxastic force. It shows that scientific acceptance need not be modeled on belief in the truth of a whole theory. Acceptance is a more complex attitude: it has a minimal doxastic core and a wider pragmatic role. The minimal belief concerns empirical adequacy; the wider role concerns the use of the theory in inquiry.

Nevertheless, this gain leaves a further problem unresolved. The restriction concerns what one must believe about an accepted theory, while leaving the theory itself as the explicit bearer of acceptance. One accepts T, while believing only that T is empirically adequate. The doxastic attitude is refined, but the object of the attitude remains coarse. The theory still functions as the unit to which acceptance is ascribed.

At this level, the limitation is structural. A scientific theory is not a homogeneous block. It contains laws, models, idealizations, auxiliary assumptions, parameters, measurement procedures, representational choices, mathematical structures, conditions of application, and possible metaphysical interpretations. These components do not all play the same role in the production, stabilization, and projection of empirical content. Some are essential to the representation of a phenomenon; others are calculational, conventional, idealizing, heuristic, or interpretive. Treating the whole theory as the bearer of acceptance risks attributing a single attitude to an internally heterogeneous object.

Historical pressure against global realist readings of successful theories supports the same diagnosis. Laudan's challenge to convergent realism shows that successful theories may contain components later judged false, idle, or ontologically misleading (Laudan, 1981). Stanford's problem of unconceived alternatives further cautions against treating current theoretical packages as the final space of serious possibilities (Stanford, 2006). These pressures do not entail constructive empiricism, but they make theory-level commitment philosophically unstable. They also motivate a more precise question: which contents survive the relevant changes of formulation, mediation, and use?

In light of van Fraassen's later analysis of scientific representation, the problem becomes still sharper. The achievement of theoretical representation is mediated by measurement and experimentation, and measuring is itself a form of representing (van Fraassen, 2008, pp. 2–3). Acceptance is therefore not only a relation to a theory; it is a relation to contents stabilized through practices, instruments, and representational uses. The remaining problem is the bearer problem:

$$\text{If acceptance is not belief in the truth of } T, \text{ what exactly is accepted?}$$

Constructive empiricism answers the question of doxastic intensity. It does not fully answer the question of allocation: which units within the theory and its associated practices receive acceptance?

3. Why Whole Theories Are Too Coarse

3.1. Theories as heterogeneous complexes

Theory-level acceptance is too coarse because theories are not homogeneous objects. They contain model structures, laws, idealizations, auxiliary hypotheses, boundary conditions, measurement procedures, representational conventions, coordinate choices, mathematical surplus, domain restrictions, and interpretive

options. These components do not have the same epistemic status, the same representational function, or the same role in scientific practice. Some are indispensable to the stabilization of a phenomenon; others are calculational, idealizing, heuristic, conventional, or interpretive.

Nothing in this argument implies that theories are dispensable. Theories provide the mathematical, representational, and inferential resources through which phenomena are classified, modelled, predicted, corrected, and projected. They organize inquiry and make possible the construction of empirical models. Yet methodological indispensability is not equivalent to being the precise bearer of acceptance. A theory may be indispensable as a framework while remaining too inclusive as the object of a single doxastic-pragmatic attitude.

Because acceptance is not a merely verbal label, this heterogeneity matters. To accept a theory is to take on commitments: to use its models, frame questions in its vocabulary, construct experiments under its guidance, classify phenomena through its distinctions, and rely on some of its structures in prediction or explanation. These commitments rarely attach to the whole theory in an undifferentiated way. Measurement may depend on a local magnitude, classification on a stable contrast, projection on a restricted relation, correction on a specific parameter, and explanation on a determinate dependency. Scientific use already discriminates within the theory. The philosophy of acceptance should make that discrimination explicit.

Selective realists have long recognized an analogous problem for realist commitment. Psillos argues that the success of science should not be attributed to all components of a theory indiscriminately, but to those responsible for success and retained through theory change (Psillos, 1999). Chakravartty likewise rejects a blanket realism about entire theories in favor of a more selective commitment to properties and structures connected with detection and causal interaction (Chakravartty, 2007). Residual empiricism accepts the allocation problem but changes the target: before asking which contents deserve realist belief, we must ask which contents deserve scientific acceptance.

3.2. Semantic structure and internal selection

Van Fraassen's semantic view gives a first reason to make this shift. Against the syntactic conception, a theory should not be identified primarily with a set of sentences, axioms, or linguistic formulations. In *Laws and Symmetry*, van Fraassen criticizes the older attempt to define the empirical content of a theory by extracting observational consequences from a linguistic system, an approach that generated artificial difficulties concerning observation language, correspondence rules, and the division between theoretical and observational terms (van Fraassen, 1989, p. 226). The semantic conception replaces this picture with a model-theoretic one: a theory is given by a class of models.

Far from weakening the bearer problem, this move strengthens it. Once theories are understood as classes of models, they are no longer flat linguistic wholes. They contain internal differentiations between models, submodels, empirical substructures, mathematical scaffolding, idealized elements, and interpreted content. The minimal distinction is:

$$\begin{aligned} \text{linguistic formulation} &\neq \text{class of models} \\ &\neq \text{interpreted scientific content.} \end{aligned}$$

A formulation is one possible presentation of a theory. A class of models organizes an abstract structural space. Interpreted content determines what is being represented, stabilized, or used in relation to a domain. These levels may be connected, but they should not be collapsed.

Within models themselves, the semantic conception also introduces an internal distinction. A model does not represent the empirical domain by its total structure. Van Fraassen writes that certain parts of models are identified as empirical substructures, candidates for representing observable phenomena (van Fraassen, 1989, p. 226). Empirical adequacy is then defined through a restricted structural relation: the relevant empirical structures must be embeddable in a model allowed by the theory (van Fraassen, 1989, p. 227). The theory need not be true as a whole. Nor must every element of every model be believed. What matters, for empirical adequacy, is that the relevant empirical structures can be embedded in an admissible model.

A purely structural answer remains insufficient. Worrall's structural realism captures an important lesson from the history of science: continuity may survive theory change at the level of structure rather than at the level of entities (Worrall, 1989). But the category of structure remains too general for the present purpose. A structure may function as mathematical scaffolding, representational format, empirical substructure, model artifact, or objectivating content. Residual empiricism therefore requires a functional criterion: the accepted content is not whatever is structurally represented, but whatever supports objectivation under admissible scientific constraints.

3.3. Representation beyond theory-level structure

Van Fraassen's 2008 account supplies a second and deeper reason. Scientific representation is not exhausted by theoretical models. It proceeds by artifacts, both concrete and abstract, and the characteristics relevant to representation are those that matter to their use (van Fraassen, 2008, pp. 1–2). Measurement and experimentation are not peripheral applications of theory; they are themselves representational practices. Measuring, van Fraassen argues, locates a target in a theoretically constructed logical space, and the outcome does not show what the measured entity is like in itself, but how it appears in the measurement set-up (van Fraassen, 2008, pp. 2–3).

At this point, the diagnosis changes. Whole theories are too coarse not only because they contain many models, but because the representational achievement of science is distributed across models, instruments, measurement procedures, data practices, perspectives, and uses. What is accepted in scientific practice is not simply a theory's total model class. It is a content made available through representational operations. Acceptance must therefore be sensitive to the content that survives and functions across those operations.

Especially important here is van Fraassen's distinction between phenomena and appearances. Phenomena are observable entities, events, or processes; appearances are the contents of observation or measurement outcomes (van Fraassen, 2008, pp. 7–9, 283–285). Measurement outcomes are not simply phenomena themselves; they are appearances of phenomena under specific measurement conditions. Thus, to save the phenomena is not simply to match a list of observational results. It is to connect phenomena, appearances, measurement contexts, and theoretical representations in a disciplined way.

A related point is made by Bogen and Woodward's distinction between data and phenomena. Data are typically local products of particular experimental and observational arrangements, while phenomena are more stable features inferred from, and supported by, bodies of data (Bogen and Woodward, 1988). Residual empiricism extends this distinction to acceptance. The accepted content is not the raw datum, nor the whole theory that explains it, but the content that supports the stabilization and reidentification of the phenomenon across admissible mediations.

3.4. Empirical adequacy without internal selection

The key point can be stated formally:

$$\mathrm{EmpAdeq}(T) \not\Rightarrow \mathrm{SelAcc}(T).$$

Empirical adequacy says that a theory succeeds with respect to the observable phenomena. It does not identify which parts, structures, constraints, or contents within the theory and its associated practices carry that success. It is a criterion of acceptability, not yet a principle of internal selection.

Under-discrimination appears in three ways. First, empirical adequacy does not separate representational content from representational scaffolding. A model may require coordinates, gauges, idealizing assumptions, limiting cases, or mathematical constructions in order to be usable. These elements may be indispensable to representation without being themselves the content accepted as empirically adequate. Secondly, empirical adequacy does not distinguish local success from global endorsement. A theory may save a class of phenomena while containing components irrelevant to that success. Thirdly, empirical adequacy does not identify the content that remains stable through revision. A measurement relation, an invariant, a classificatory contrast, or a dependency pattern may survive changes in formulation, model, or interpretation.

The required shift is therefore:

What does it mean to accept T?

$\Downarrow$

Which content within T is acceptable under scientific constraints?

The first question treats the theory as the unit of attitude. The second treats the theory as a structured source from which acceptance-relevant content must be selected. This is the decisive move from constructive empiricism to residual empiricism.

4. From Theories to Classes of Objectivating Content

4.1. Objectivating content classes

Rejecting theory-level acceptance cannot mean merely choosing a smaller fragment of the theory. A class of objectivating content is not a selected sentence, not an empirical substructure taken in isolation, not a theoretical entity, and not a piece of formalism. It is the unit that remains identifiable as the same scientific content across admissible variations of formulation, model, mediation, measurement, and use. The shift is therefore not from whole theories to smaller theories, but from theories as global bearers to content classes as functionally stabilized units.

Let this unit be denoted by:

$$[C]_{S,\Pi}$$

where S denotes the scientific regime in which the content is produced and assessed, and Π denotes the relevant local profile. The regime S fixes the broad scientific setting: domain, modelling practices, admissible mediations, standards of establishment, measurement procedures, and correction conditions. The profile Π fixes the local conditions under which a content is used to identify, stabilize, correct, and project a phenomenon. The notation $[C]$ indicates that the content is already quotient-like: differences in linguistic presentation, notation, coordinates, modelling format, measurement set-up, or representational

scaffolding are disregarded when they do not alter the content's objectivating role.

A working definition is:

$$[C]_{S,\Pi} = [C]_{\equiv^{S,\Pi}_{\text{obj}}}.$$

Here, $[C]_{\equiv^{S,\Pi}_{\text{obj}}}$ is the equivalence class of contents that preserve the same objectivating role under the admissible variations fixed by S and Π. The definition does not require a full metaphysics of the content's worldly ground. It only requires that the content be sufficiently stable, discriminating, and usable within scientific practice. It must support a phenomenon's identification, stabilization, correction, and projective reuse. That is enough for acceptance; it is not yet enough for realism.

4.2. Why content classes are the right bearers

Classes of objectivating content are the right bearers of residual acceptance for three reasons.

First, they are finer than whole theories. A theory may be accepted for reasons that concern only some of the contents articulated within it. Empirical success, experimental control, classificatory stability, or projective reliability rarely depends on the entire theoretical package. A theory can include surplus structure, idealized assumptions, optional interpretations, and conventional representational devices while still providing contents that are scientifically indispensable. Historical instability at the theory level, emphasized by the pessimistic induction and the problem of unconceived alternatives, supports this refinement without entailing skepticism about all scientific content (Laudan, 1981; Stanford, 2006).

Second, content classes are more stable than isolated sentences. Scientific acceptance is not normally tied to a single formulation. The same accepted content may be expressed through different descriptions, coordinate systems, models, diagrams, equations, or experimental mediations. Were the bearer of acceptance an individual sentence, acceptance would become too sensitive to changes in presentation. A content class preserves the same accepted content across admissible reformulations, provided that the objectivating role remains unchanged.

Third, content classes are tied to scientific use. Acceptance involves measurement, classification, modelling, correction, projection, and revision. These practices do not operate on whole theories all at once. They operate with determinate contents: quantities, relations, invariances, contrasts, dependencies, correction procedures, modelled structures, and stabilized patterns. The proper bearer of acceptance is therefore the unit that can be used, corrected, transported, and retained through these practices.

Accounts of scientific representation that resist reducing representation to similarity or isomorphism alone strengthen this point. Suárez argues that scientific representation should not be defined by a simple structural relation between model and target, since representational success depends on use and inferential practice (Suárez, 2003). Frigg and Nguyen likewise emphasize that models involve carriers, targets, contents, and representational functions rather than a single primitive relation of resemblance or structural identity (Frigg and Nguyen, 2020). Residual empiricism draws the corresponding lesson for acceptance: the accepted content is not whatever appears in the representational artifact as a whole, but what performs the relevant objectivating function under the conditions of use.

4.3. Order of determination

The order of determination is therefore:

$$\text{formulation} \longrightarrow \text{objectivated content} \longrightarrow [C]_{S,\Pi} \longrightarrow \text{possible ontological commitment}.$$

Each step must be kept distinct. A formulation is a linguistic, mathematical, diagrammatic, or instrumental presentation. It gives access to a content, but it is not identical with that content. Different formulations may express the same content, and one formulation may contain elements that do not belong to the accepted content.

Objectivated content is what a formulation, model, measurement, or mediation makes available for public scientific use. It is already more than a syntactic item: it is a content that can be applied, tested, corrected, and inserted into practices of measurement, classification, modelling, or projection. Yet objectivated content may still contain elements whose role is merely auxiliary, representational, or idealizing.

Stabilization under the admissible variations fixed by S and Π produces the class $[C]_{S,\Pi}$. At this level, the accepted unit is not the theory, not the model, not the instrument, and not a single empirical substructure. It is the content that remains identifiable through the relevant variations because it continues to support the same objectivating function.

Possible ontological commitment is a further step. It requires more than acceptance. To move from $[C]_{S,\Pi}$ to realism, one would have to show not only that the content is objectivatingly adequate, but also that it is ontologically grounded as revealing or tracking a constituent, structure, or modal feature of the world. Residual empiricism denies that this further step is contained in acceptance itself.

In stance-theoretic terms, residual empiricism is not the thesis that content classes are the only legitimate objects of philosophical concern. It is a policy of scientific acceptance: allocate acceptance to the content that survives admissible objectivating operations, and withhold the additional realist transition unless a distinct grounding argument is supplied. Its stopping point is therefore normative, not ontological.

5. Objectivating Adequacy

5.1. Definition

Having identified the bearer of residual acceptance as a class of objectivating content, we can now specify the corresponding criterion of acceptability. The relevant criterion is not truth, since residual empiricism does not infer from acceptance to realism. Nor is it merely empirical adequacy in van Fraassen's original sense, since the issue is no longer only whether the observable phenomena can be embedded in models allowed by a theory. The relevant criterion is objectivating adequacy.

A class of content $[C]_{S,\Pi}$ is objectivatingly adequate when it publicly supports the identification, stabilization, correction, and projective reuse of a phenomenon within a scientific regime S and a local profile Π. The notion is functional and public. It concerns what the content does in scientific inquiry: whether it enables a phenomenon to be recognized as the same phenomenon across relevant mediations, stabilized against noise and artefact, corrected under controlled conditions, and reused in further empirical or theoretical contexts.

Compactly, the criterion may be stated as follows:

$$\mathrm{ObjAdeq}_{S,\Pi}([C]) \iff \mathrm{Id}_{S,\Pi}([C]) \wedge \mathrm{Sta}_{S,\Pi}([C]) \wedge \mathrm{Corr}_{S,\Pi}([C]) \wedge \mathrm{Proj}_{S,\Pi}([C]).$$

Here Id denotes the contribution of $[C]$ to identifying the target phenomenon; Sta, its contribution to stabilizing that phenomenon across admissible variations; Corr, its role in correction, error-control, and artefact-discrimination; and Proj, its capacity to be reused or transported in further admissible contexts. These conditions do not define a metaphysical ground. They define a public scientific role.

Indexation is essential. A content is not adequate in the abstract, but adequate relative to a regime of scientific practice and a local profile of phenomena, mediations, measurement procedures, contrasts, and standards of correction. The same formal expression may function differently across regimes, and the same phenomenon may require different mediations under different profiles.

5.2. Beyond empirical adequacy

Objectivating adequacy is stronger than empirical adequacy because it requires more than compatibility with observable phenomena. In constructive empiricism, empirical adequacy concerns whether the observable phenomena can be saved by the theory. In the semantic formulation, this is articulated through empirical substructures and their embeddability into a model allowed by the theory (van Fraassen, 1989, pp. 226–227). This criterion is sufficient for constructive empiricism because acceptance requires belief only that the theory is empirically adequate, not that it is true (van Fraassen, 1980, p. 12).

Residual empiricism accepts this restriction, while refining the target. The question is not only whether phenomena are saved, but which contents make them publicly objectivable. A theory may save the phenomena while leaving indeterminate which parts of its models, procedures, or representational devices actually support the stabilization of those phenomena. Empirical adequacy evaluates the theory with respect to observable phenomena; objectivating adequacy evaluates a selected content class with respect to the operations through which a phenomenon is identified, stabilized, corrected, and reused.

Van Fraassen's 2008 distinction between phenomena and appearances gives this refinement its exact point. Phenomena are observable entities, events, and processes; appearances are the contents of observation or measurement outcomes (van Fraassen, 2008, pp. 283–285). A measurement outcome shows how a phenomenon appears in a measurement set-up, not simply how the phenomenon is in itself. Objectivating adequacy therefore asks which content coordinates phenomena, appearances, instruments, models, and correction procedures into a stable public target.

From another angle, the distinction between data and phenomena yields the same lesson. Experimental data are often local, noisy, and device-dependent, while phenomena are stable patterns or processes inferred from data and treated as targets of explanation (Bogen and Woodward, 1988). Objectivating adequacy specifies what kind of content can bridge that gap: the content must be usable in stabilizing a phenomenon beyond the immediate data that prompted its identification.

The difference can be expressed as follows:

$$\mathrm{EmpAdeq}(T) \not\Rightarrow \mathrm{ObjAdeq}_{S,\Pi}([C]).$$

A theory may be empirically adequate without a particular class of content being objectivatingly adequate. Conversely, a class of content may be accepted because it performs an objectivating role even when the larger theory in which it appears contains idealizations, surplus structure, or interpretations that are not themselves accepted. Empirical adequacy is a theory-level criterion; objectivating adequacy is a content-level criterion.

Four dimensions mark this additional strength. First, the content must be identificatory: it must help determine what counts as the same phenomenon rather than a merely similar occurrence. Second, it must be stabilizing: it must survive relevant variations in formulation, measurement, modelling, or mediation. Third, it must be corrective: it must participate in the distinction between signal, error, artefact, and admissible variation. Fourth, it must be projective: it must support reuse beyond the immediate case in

which it was first established.

Robustness plays a central role here. Wimsatt treats robustness as a way of stabilizing results across independent derivations, models, or procedures (Wimsatt, 2007). Residual empiricism adopts the lesson while keeping the empiricist restriction: robustness contributes to objectivating adequacy, but does not by itself settle the question of ontological commitment.

5.3. Below realism

Objectivating adequacy remains weaker than realism. The crucial non-implication is:

$$\mathrm{ObjAdeq}([C]_{S,\Pi}) \not\Rightarrow \mathrm{Real}([C]_{S,\Pi}).$$

Objectivating success is a reason for acceptance, not yet a reason for ontological commitment. A content may be indispensable for public scientific objectivation without thereby being established as a constituent of the world.

Here lies the anti-collapse condition for residual empiricism. Without it, the position would simply become a selective realism: one would accept only the contents that support objectivation and then treat those contents as real. Residual empiricism blocks this transition. The fact that a content is stable, corrective, and projectively reusable shows that it has scientific authority as a content of inquiry. It does not by itself show that it is ontologically grounded as part of the furniture, structure, or modal architecture of the world.

Van Fraassen's critique of resemblance-based representation strengthens this point. Successful representation may require distortion, abstraction, addition, and selective unlikeness. Thus no general inference runs from the success of a representation to the overall likeness of what is represented (van Fraassen, 2008, pp. 7–15). The same holds for objectivating content. Its scientific success does not by itself show that it mirrors, corresponds to, or reveals the world's structure.

At the level of philosophical attitude, van Fraassen's stance-based empiricism gives the same restriction a broader status. The empiricist does not need to formulate a rival metaphysical doctrine in order to resist realism. She may adopt a stance that refuses to treat successful scientific representation as automatically authorizing metaphysical extension (van Fraassen, 2002, pp. 48–49, 61–63). Residual empiricism applies that refusal locally: objectivating adequacy fixes what may be accepted in science; it does not fix what must be believed about the world's ultimate or local constitution.

A realist inference therefore requires an additional premise. It must be shown not only that $[C]$ is objectivatingly adequate, but also that the adequacy of $[C]$ is best explained by, or grounded in, a worldly structure corresponding to $[C]$. This premise is precisely what robust scientific realists and semi-realists try to supply, whether through reference, causal detection, structure, or properties (Psillos, 1999; Chakravartty, 2007). Residual empiricism does not refute that further project. It denies that it is contained in acceptance itself. It grants the scientific legitimacy of the content while refusing to identify legitimacy with ontological disclosure.

6. Residual Acceptance

6.1. Doxastic component

Residual empiricism preserves the van Fraassenian insight that acceptance is not belief in truth. Van Fraassen's distinction between acceptance and belief is not a rejection of all doxastic commitment; it is a restriction on the kind of belief required by scientific acceptance. To accept a theory is not to believe that the theory is true, but to believe that it satisfies the relevant criterion of acceptability. In constructive empiricism, that criterion is empirical adequacy: accepting T requires belief that T is empirically adequate, not belief that T is true (van Fraassen, 1980, p. 12; 1991, p. 3).

Residual empiricism retains this structure while changing its bearer and its criterion. The accepted item is not the whole theory T, but a selected class of objectivating content $[C]_{S,\Pi}$. The relevant belief is not that this content is true as a worldly constituent, but that it is adequate as a content of objectivation. The minimal doxastic commitment is:

$$\mathrm{Accept}_{RE}^{S,\Pi}([C]_{S,\Pi}) \Rightarrow \mathrm{Believe}\big(\mathrm{ObjAdeq}_{S,\Pi}([C]_{S,\Pi})\big).$$

This implication gives residual acceptance its empiricist form. Acceptance requires belief, but the belief concerns objectivating adequacy rather than ontological truth. The subject is entitled to believe that $[C]_{S,\Pi}$ supports the public identification, stabilization, correction, and projective reuse of a phenomenon. The subject is not thereby committed to believing that $[C]_{S,\Pi}$ is a constituent of the world.

Accordingly, the doxastic component is weaker than realist belief but stronger than mere instrumental reliance. It is weaker than realist belief because it does not assert:

$$\mathrm{Believe}\big(\mathrm{True}_{S,\Pi}([C]_{S,\Pi})\big) \quad \text{or} \quad \mathrm{Believe}\big(\mathrm{Real}_{S,\Pi}([C]_{S,\Pi})\big).$$

It is stronger than instrumental reliance because it does not reduce acceptance to successful use. The belief concerns a publicly assessable adequacy of the content itself. The accepted content is not merely useful; it is adequate for objectivation.

6.2. Pragmatic component

Acceptance also has a pragmatic dimension. Van Fraassen insists that acceptance of a theory has a pragmatic dimension which guides action and research, while involving no more belief than belief in empirical adequacy (van Fraassen, 2008, p. 3). Residual empiricism keeps this claim but shifts its bearer. The pragmatic commitments of acceptance do not attach uniformly to an entire theory. They attach to the content classes through which scientific inquiry is actually conducted.

Residual acceptance has the following structure:

$$\mathrm{Accept}_{RE}^{S,\Pi}([C]_{S,\Pi}) = \mathrm{Believe}\big(\mathrm{ObjAdeq}_{S,\Pi}([C]_{S,\Pi})\big) + \mathrm{Commit}_{S,\Pi}([C]_{S,\Pi}).$$

The first term identifies the minimal doxastic core: belief that the content is adequate for objectivation. The second identifies the practical commitments involved in using that content. These commitments include measurement, classification, modelling, local explanation, projection, correction, and revision. The formula preserves the claim that acceptance is richer than belief, while avoiding the assumption that this richness belongs to whole theories as undifferentiated objects.

The operator $\mathrm{Commit}_{S,\Pi}$ should be understood in light of van Fraassen's stance-based conception of empiricism. A stance is not exhausted by belief in a proposition. It includes policies of inquiry, standards of permissible demand, refusals of certain metaphysical extensions, and practical commitments concerning what counts as authoritative in inquiry (van Fraassen, 2002, pp. 48–49, 61–63). Residual acceptance is therefore not a merely psychological attitude toward $[C]_{S,\Pi}$. It is a regulated posture toward scientific use: to accept $[C]_{S,\Pi}$ is to treat it as available for measurement, classification, modelling, correction, projection, and revision under the constraints of S and Π.

Scientific practice rarely operates with entire theories at once. One measures with determinate quantities and procedures, not with a whole theory. One classifies by stable contrasts, not by a total theoretical ontology. One models through selected structures, not through the complete theoretical package. One projects some contents under restricted conditions, while leaving other components local, auxiliary, idealized, or dispensable. The pragmatic component of acceptance therefore reveals the same selection that the doxastic component requires.

6.3. Against minimal empiricism

Residual empiricism is not a minimal empiricism. It does not merely say that one should believe less. It says that one should accept more precisely. A purely minimal empiricism would risk reducing empiricism to doxastic caution: withhold belief in unobservables, avoid metaphysical commitment, and remain satisfied with empirical adequacy. Residual empiricism gives a positive account of what is accepted: objectivating contents selected under scientific constraints.

The relevant question is not only:

How much of a theory should be believed?

but:

Which content is fit to be accepted?

The first question concerns doxastic intensity. The second concerns the unit of scientific uptake. Constructive empiricism gives the correct answer to the first question: acceptance does not require belief in truth. Residual empiricism adds the missing answer to the second: acceptance should bear on classes of objectivating content, not on whole theories.

Positive conditions must therefore constrain the accepted content. It must be informative enough to discriminate something scientifically relevant. It must be publicly usable in measurement, classification, modelling, or correction. It must be exposed to possible defeat by further inquiry. It must be sufficiently stable to survive admissible changes of formulation or mediation. It must be transportable under specified conditions, rather than merely successful in one isolated case. These conditions do not amount to realism, but they make acceptance a robust scientific attitude.

The position can be summarized by three contrasts:

$$\begin{aligned} \text{instrumental success} &< \text{objectivating adequacy} \\ &< \text{ontological commitment.} \end{aligned}$$

The first level is too weak because it does not secure a public content of objectivation. The third level is too strong because it converts objectivating success into a claim about what the world contains or grounds. Residual acceptance occupies the intermediate level.

Finally, the empirical stance prevents residual empiricism from being misread as a new doctrine of scientific ontology. It is not the claim that objectivating contents alone are real, nor the claim that non-objectivating contents are unreal. It is a disciplined stance concerning acceptance: accept what has been publicly stabilized as objectivating content; withhold the further metaphysical claim unless a distinct realist argument establishes it.

7. The Realist Objection

7.1. Form of the objection

A central objection is straightforward. Residual empiricism claims to remain empiricist while accepting contents that are stable across admissible formulations, robust under correction, projectively reusable, and indispensable to the public objectivation of phenomena. Yet these are precisely the features that scientific realists usually take to support belief in more than empirical adequacy. If a content survives changes of representation, resists correction, organizes successful inquiry, and remains available for projection, then it seems to possess more than empiricist authority. It seems to reveal something about the structure of the world.

The objection may be formulated as follows:

Objection 1. *If a content is stable across admissible formulations, robust under correction, projectively reusable, and indispensable to objectivation, then it seems to be more than merely acceptable. It seems to reveal something real.*

This objection is not superficial. It presses on the exact point at which residual empiricism becomes stronger than constructive empiricism. Residual empiricism adds a further demand: the accepted item must be a class of content capable of supporting identification, stabilization, correction, and projective reuse. The realist can therefore ask why this further strength should not be interpreted as a reason for realism.

Two versions of the objection should be distinguished. The first is explanatory: the best explanation of the stability and projective success of $[C]_{S,\Pi}$ is that $[C]_{S,\Pi}$ tracks something real. This is a local version of the realist appeal to success: successful science would be miraculous unless at least some of its central claims were approximately true or world-tracking (Psillos, 1999). The second is normative: if scientific practice already treats $[C]_{S,\Pi}$ as indispensable to objectivation, then refusing realism about $[C]_{S,\Pi}$ seems artificially cautious. Residual empiricism must answer both without reducing objectivating adequacy to mere utility and without collapsing into residual realism.

7.2. Residual empiricist reply

The reply is that the inference from objectivating adequacy to realism requires an additional premise. Stability under scientific mediation warrants acceptance of the content as a public objectivating unit. It does not by itself establish that the content is ontologically grounded as a constituent, structure, or modal feature of the world.

Reply 1. *The inference from objectivating adequacy to realism requires an additional premise. Stability under scientific mediation warrants acceptance of the content as a public objectivating unit. It does not by itself establish that the content is ontologically grounded as a constituent of the world.*

The relevant distinction is between a content's scientific authority and its ontological interpretation.

Objectivating adequacy establishes that a content is fit for scientific uptake: it can be used to identify a phenomenon, stabilize it across admissible variations, correct errors and artefacts, and support projection. These features justify acceptance. They do not determine what, if anything, in the world makes the content adequate. The realist step adds a claim about worldly grounding; residual empiricism withholds that claim.

Formally:

$$\mathrm{ObjAdeq}_{S,\Pi}([C]) \Rightarrow \mathrm{Accept}^{S,\Pi}_{RE}([C]),$$

but:

$$\mathrm{ObjAdeq}_{S,\Pi}([C]) \not\Rightarrow \mathrm{Real}_{S,\Pi}([C]).$$

The first implication gives the positive doctrine. Objectivatingly adequate content is acceptable. The second non-implication gives the empiricist restriction. Acceptance of such content does not entail belief that the content corresponds to, reveals, or is grounded in a real constituent of the world.

Van Fraassen's rejection of the Appearance from Reality Criterion reinforces this point. That criterion demands that appearances be derived from an underlying reality, not merely predicted or accommodated (van Fraassen, 2008, pp. 280–283). But this is a stronger demand than empirical science need always satisfy. Prediction of appearances, measurement outcomes, and systematic objectivation may be scientifically sufficient without satisfying the realist demand to derive appearances from what is really going on. Residual empiricism generalizes this lesson: objectivating adequacy is enough for acceptance, but not enough for ontological commitment.

Within van Fraassen's empirical stance, this stopping point has the proper status. The empiricist need not formulate a competing thesis about what ultimately exists. She may instead refuse to treat every successful scientific content as automatically demanding metaphysical completion (van Fraassen, 2002, pp. 48–49, 61–63). Residual empiricism is precisely such a refusal, but made local and content-sensitive. It accepts $[C]_{S,\Pi}$ as a unit of scientific objectivation; it does not infer that $[C]_{S,\Pi}$ must be a unit of ontology.

A realist may respond that the best explanation of objectivating adequacy is often a worldly ground. Residual empiricism need not deny this possibility. It only denies that such an explanation is contained in acceptance itself. A further realist argument may be developed, but it must be presented as an additional argument. It cannot be smuggled into the definition of scientific acceptance.

The difference between residual empiricism and residual realism may therefore be stated as follows:

$$\begin{aligned} \text{Residual empiricism:} \quad & \mathrm{ObjAdeq}_{S,\Pi}([C]) \Rightarrow \mathrm{Accept}^{S,\Pi}_{RE}([C]); \\ \text{Residual realism:} \quad & \mathrm{ObjAdeq}_{S,\Pi}([C]) \wedge \mathrm{Ground}_{S,\Pi}([C]) \Rightarrow \mathrm{Real}_{S,\Pi}([C]). \end{aligned}$$

The empiricist accepts the content as scientifically adequate for objectivation. The realist adds a grounding condition and treats the content as ontologically significant. The two positions can therefore agree on the scientific importance of $[C]$ while disagreeing about whether this importance warrants ontological commitment.

7.3. Stopping at objectivating adequacy

Residual empiricism stops at objectivating adequacy. This stopping point is not a defect; it is the position's defining discipline. The accepted item is not a whole theory, because theories are too heterogeneous. It is not a mere instrument, because the accepted content is literal, structured, and truth-evaluable. It is not an

ontological posit, because objectivating adequacy does not by itself establish worldly grounding. It is a class of content accepted as adequate for public objectivation.

Such a stopping point prevents two symmetrical errors. The first would be minimal empiricism: accept only empirical adequacy and leave the internal structure of accepted scientific content unspecified. The second would be selective realism by default: identify stable objectivating content with realistically warranted content. Residual empiricism rejects both moves. It requires more selection than constructive empiricism, but less ontological commitment than scientific realism.

The intermediate position is therefore not unstable:

$$\text{empirical adequacy} \;<\; \text{objectivating adequacy} \;<\; \text{ontological commitment.}$$

Empirical adequacy concerns the saving of observable phenomena. Objectivating adequacy concerns the public stabilization and use of a content in scientific inquiry. Ontological commitment concerns the claim that the content is grounded in, or reveals, some worldly structure. These three levels must be distinguished. Residual empiricism occupies the middle level.

A stance-theoretic stopping rule follows: accept what is publicly objectivating, but do not infer from objectivation alone to ontology. This rule is not a factual thesis about the world's furniture. It is a policy of philosophical and scientific restraint. It determines how far acceptance reaches without transforming that acceptance into realism.

8. Conclusion: Acceptance Without Theory-Level Commitment

Constructive empiricism was right to separate acceptance from belief in truth. It showed that one can accept a scientific theory without believing that the theory is true. Its central claim remains decisive: scientific acceptance requires, at most, belief in empirical adequacy, not belief in the theory's truth as a complete description of the world (van Fraassen, 1980, p. 12). It also preserves the literal character of theoretical discourse: theories remain truth-evaluable; they are not reduced to instruments or calculational fictions (van Fraassen, 1991, p. 3).

The argument of this paper has been that this restriction is correct but incomplete. Constructive empiricism restricts the doxastic force of acceptance, but it leaves the bearer of acceptance too coarse. It tells us that accepting T does not require believing that T is true. It does not sufficiently explain why T, the whole theory, should remain the proper object of acceptance. Once theories are understood semantically as classes of models, and once scientific representation is understood through measurement, instruments, perspective, appearances, and use, theory-level acceptance becomes a shorthand rather than a precise account.

Van Fraassen's conception of empiricism as a stance adds a final clarification. Residual empiricism is not a new thesis about what the world contains. It is a stance governing the allocation of scientific acceptance. It regulates the transition from scientific content to commitment. In that respect, it extends constructive empiricism without turning empiricism into a rival metaphysical doctrine.

Residual empiricism refines the object of acceptance. The accepted item is not the whole theory, an isolated sentence, a theoretical entity, a formal substructure, or a model taken in its entirety. It is a class of objectivating content: a content stable across admissible formulations, models, mediations, measurements, and uses, and capable of supporting the public identification, stabilization, correction, and projective

reuse of phenomena.

The central replacement is therefore:

$$\text{Accept}(T) \Rightarrow \text{Believe}(\text{EmpAdeq}(T))$$

by:

$$\text{Accept}_{RE}^{S,\Pi}([C]) \Rightarrow \text{Believe}\big(\text{ObjAdeq}_{S,\Pi}([C])\big).$$

The first formula captures the constructive empiricist restriction on belief. The second adds a restriction on the bearer. Scientific acceptance should not be allocated to whole theories as undifferentiated objects. It should be allocated to those content classes that are adequate for objectivation under a scientific regime S and a local profile Π.

This refinement also clarifies the difference between residual empiricism and scientific realism. Objectivating adequacy is stronger than empirical adequacy because it requires more than saving observable phenomena. It requires a public role in scientific objectivation. Yet it remains weaker than realism because it does not entail ontological commitment:

$$\text{ObjAdeq}_{S,\Pi}([C]) \not\Rightarrow \text{Real}_{S,\Pi}([C]).$$

The content may be scientifically acceptable without being believed to reveal a worldly constituent, structure, or ground.

The final result is a more discriminating empiricism. It does not reduce science to prediction, observation, or instrumental success. Nor does it convert scientific success into belief in theoretical truth. It accepts scientific contents where they have been stabilized as public units of objectivation, and it suspends the further inference to ontology. Residual empiricism therefore does not merely say that we should believe less. It says that we should accept more precisely.

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