

Faces of Causation
Carrier Theory of Causation

12

The Carrier Theory of Causation

Even if there is only one possible unified theory, it is just a set of rules and equations. What is it that breathes fire into the equations and makes a universe for them to describe?

Stephen Hawking, *A Brief History of Time*

12.1 Circularity in the Causal Mesh

Chapter 2 presented the antiphysicalist arguments through an analogy to *Life*, an artificial world. In it, I explained why the “on” and “off” properties at the heart of *Life*’s physics, its schematically characterized categories, were unable to support consciousness. Consider the question, *What is it to be an “on” property within Life?* We only need to cite its distinctness from the “off” property and that its patterns of instantiation exhibit the lawlike regularity prescribed by the rules. This schematic account entirely encompasses the categorical being of an “on” property within *Life*.

The last few chapters presented ideas that enrich the minimal view of causal content explicit in the bare physics of *Life*. I have argued for effective and receptive faces to causation, have given a positive account of the relations between them, and detailed the distinct contributions they make to the causal character of a world. Simplicity dictated the form of the Theory of Causal Significance, and it proposed only that nature’s deep structure consisted of receptive connections, effective properties, and a metaphysical background of possibility. Even space and time evaporated as fundamental entities. Still, with respect to consciousness, the new metaphysics remains limited by the fundamental shortcoming of the *Life* world because we still have a merely schematic understanding of what it is to be a world with causal content.

To describe effective properties, we need to (1) make names for the determinable types; (2) stipulate that the names designate distinct entities; (3) define a range of determinate values for each determinable; and (4) define how the presence of each effective property within a shared receptive connection contributes to the constraints on the overall state of a causal nexus. Descriptions meeting these conditions create identity conditions for each property and for the system of properties as a whole.

I call the kind of circularity involved *contrastive circularity*. A contrastive circularity exists when we stipulate a set of distinct elements and we use the stipulated distinctness to create a relational story yielding the rest of each element's identity conditions. For any kind of element *X*, we may answer the question "What is it to be an *X*?" by citing its distinctness from the other elements of the system and a (perhaps fuzzy) set of critical external relations to other elements within that system.

Contrastive circularity is enough to distinguish effective properties from one another, such as "on" from "off," but a circularity of a different kind helps to distinguish receptive and effective properties. Receptive and effective properties together form a causal nexus. Here are the relevant definitions again:

A causal nexus (or nexii), A receptive connection binding two or more determinable individuals.

Effective properties. Properties that contribute to constraints on the determinate states of a causal nexus.

Receptive properties. Connective properties enabling individuals to become members of causal nexii and to be sensitive to constraints on the state of nexii where they are members.

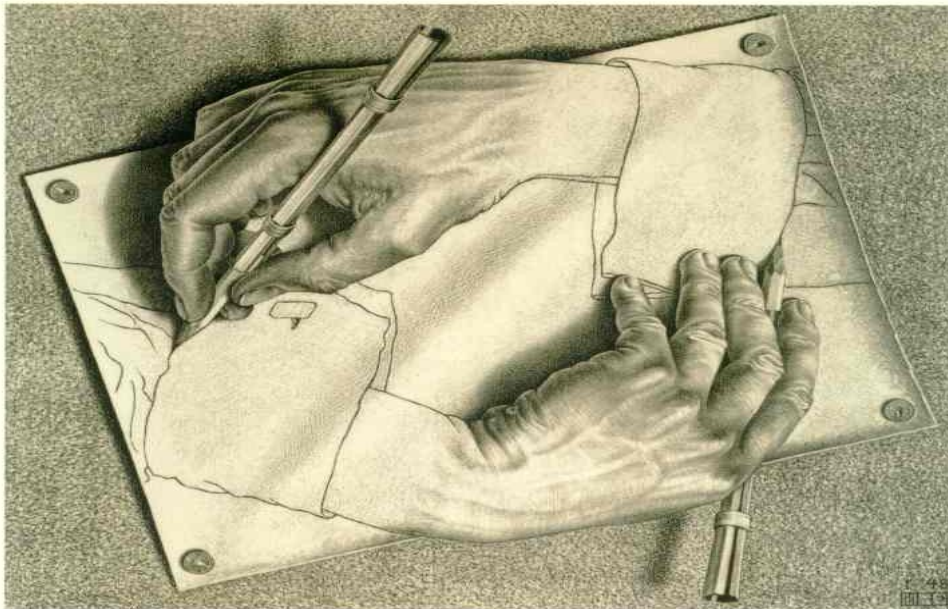
The binding relation mentioned in the definition of *causal nexus* is an internal relation through which the effective and receptive properties may complete one another's inherently incomplete natures. Receptive and effective properties, therefore, do not relate categorically in a merely negative, contrastive way. Receptivity positively presupposes effectiveness and vice versa. My name for this kind of circularity is *compositional circularity*. A circular relation is compositional when each element is partially defined by the way that it presupposes the other as a positive component in its own nature (see figure 12.1).

Figure 12.1 Compositional Circularity

Of the two kinds of circularity, contrastive circularity in particular is a symptom of schematic thinking. Reflection on circular contrasts naturally raises questions about how these categories come to be in a world. After all, if *A* is defined as that which is distinct from *B*, *B* is defined as that which is distinct from *A*, and *no other* categorical facts are true of them other than relations they share, it seems that the existence of each presupposes the existence of the other. The circularity has the logical feel of a vicious regress, and questions about how such properties get their footholds on existence in the first place forcefully present themselves.

Simplicity is not the only theoretical virtue. What of intelligibility and what of uniformity with other knowledge? In my construction of the Carrier Theory of Causation, I am as concerned with matters of intelligibility and uniformity as I am with simplicity. By *intelligibility* I mean the construction of a model for the circular schema that is somehow based on things within our experience of the world or things that can be conceived in analogy with our experience of the world. By *uniformity with our knowledge*, I mean basing the model on the evidence of how similar problems are solved in other domains. Understanding the ontological ground for the existence of these kinds of circularly in

terdependent properties in conformance with simplicity, intelligibility, and uniformity is the chief task of this chapter.



12.2 Circularity Instantiated

Although puzzling, circularity is not deadly. The world is full of systems that realize circularly interlocking categories. The *Life* world itself provides an example, as people implement finite *Life* worlds in a variety of ways. The original *Life* world was implemented on a checkerboard using checker pieces, and the implementations most familiar to people today are on computers. I think we can gain some insight by examining how a miniature checkerboard can become a *Life* world.

Life worlds are parasitic on the presence of properties whose categorical natures¹ are *not* wholly defined by the *Life* schema but which already embody the distinctiveness needed to instantiate *Life* properties. For example, in a checkerboard implementation of *Life*, the red and black checkers play the role of the “on” and “off” properties. The color distinction between them, a distinction that is not intrinsic to the conceptual schema that defines *Life*, is an extrinsic carrier of the needed distinctness between the “on” and “off” properties. The checkerboard carries the geometry of *Life*'s two-dimensional space and allows us to create coordinate identities for the places in the world using the squares on the checkerboard. Finally, the intentions of the human beings manipulating the board guarantee the lawfully reliable patterns of instantiation between the properties (to the extent that human intentions are lawfully reliable). Once again, these human intentions have a nature that outruns the terms of the *Life* schema.

The form of the solution seems to be this: The circular properties of *Life* exist because we find elements with preexisting kinds of properties that, when put in the right combination, carry the relations the *Life* schema dictates. I call these elements *carriers*.

Definition: Carriers—Objects or properties whose natures outrun the categories of a given schema but which can enter into the appropriate relations with one another when put into the proper combinations.

Carriers are also present in computational implementations of *Life*. In those cases, the physical distinctness of the machine states carries the distinctness between the “on” and “off” properties. The major difference between the computational case and the checkerboard case is that the tokens in the computational case can directly carry the lawful reliability of the “on” and “off” properties, bypassing reliance on human intentions.

One naturally sees the carriers as having natures that are at least partially extrinsic to the *Life* world they are implementing. For instance, the specific distinction between the redness and blackness of the checkers goes beyond the requirement of generic distinctness for “on” and “off” properties. This observation applies to more than just the facts about their distinctness. The causal contents of the elements of the system transcend the causal powers attributable to them as “on” or “off” properties. This suggests a useful definition of what it is to be an extrinsic property, relative to a system the property occurs within.

Definition: P is an extrinsic property *within* a system *S* if, and only if, *P* is instantiated within an instance of *S* and *P* has a nature that is not exhausted by its relations to other elements as they are defined within *S*.

The idea of being an *extrinsic* property *within* the system *S* is different from the idea of being a property that is *intrinsic* to the system *S*. The properties intrinsic to a system are those whose identity conditions are grounded in relations between an object (or objects) in the system and other elements of the system.

Thus properties *intrinsic* to systems both constitute and presuppose the existence of the systems they exist within, which makes them unlike properties that are *extrinsic within* those systems. Stating the idea in another way, the properties intrinsic to a system have no nature entering into their categorical being except those defined by a system of the relevant type. In this sense, the categories of their systematic contexts exhaust their categorical natures.

For example, the properties of being “on” and “off” are properties intrinsic to the system of concepts defining *Life* because such properties both constitute and presuppose the existence of a *Life* world. In contrast, being a red checker is an extrinsic property *within* some implementations of the *Life* world. Redness, although present within some implementations of such worlds, is neither dependent on nor definable by the system of concepts constitutive of *Life*. The categorical being of redness, unlike the being of “offness,” is independent of the conceptual scheme demarcating *Life*.

Finally, a property being extrinsic within a system does not entail that it is extrinsic *tout court*, as it may be intrinsic to some *other* system. This is the case with computational states that may implement *Life*, as those states, qua computational states, are extrinsic within *Life* but intrinsic to the computational system they exist within.

Contrasts One particularly important feature of the examples is how extrinsic properties may implement the stipulative contrasts within the system in virtue of what I call internal contrasts.

Definition: An *internal contrast* exists between *A* and *B* if, and only if, there is a comparative relation *R* such that necessarily, if *A* exists and *B* exists, then $R(A,B)$.

Any two intrinsically distinct things have at least one internal contrast, the relation of being distinct. Additionally, internal contrasts are a kind of supercategory here. They include the *stipulative contrasts* observed to exist within schemas and can include other kinds of contrasts, too. For example, rather than composing the involved properties the way that stipulative contrasts do, internal contrasts instead may be *consequences* of the natures had by the properties. In fact, internal contrasts that are not themselves stipulative are good candidates to *implement* systems of stipulative contrasts: As long as both *A* and *B* are present within a world, the relation *R* that holds between them may *carry* a stipulative contrast. Thus, even though the entities composed by stipulative contrasts presuppose one another, they may come into existence within a system all at once by being a consequence of the nonstipulative internal contrasts of the carriers.

Consider red and black checkers again. The redness and blackness constitute an *internal contrast* able to carry the *stipulative contrast* between “on” and “off” properties in a *Life* world. Although internal, the contrast between the colors is not stipulative because we cannot reduce the natures of the phenomenal colors to a structure of pure difference relations holding between them. Finally, it is worth anticipating that *R* may be a more complex kind of relation than mere distinctness, although I have not surveyed any such examples yet.

Reflection on the variety of circular systems that actually exist in the world strongly suggests that each exists in virtue of carriers that are extrinsic to the system. For example, a chess game consists of a circularly interdependent set of types: pawns, rooks, kings, queens, and so forth. Each type is defined by the set of allowable moves it may make within the game as a whole. Without the context of the game, no particular type could exist. The circularity between their categorical natures makes it look as if the existence of each part of the game presupposes the existence of the game as a whole, which, in turn, presupposes the existence of the parts (Sellars 1963b; Haugeland 1993).

Why isn't the circularity of chess categories deadly? The reason chess games can actually exist is that each implementation takes advantage of external properties to introduce, piecemeal, the distinctions and dependencies that are defined whole cloth within the conceptual system. For instance, pieces that are recognizably physically distinct are used to stand in for tokens of distinct types. Board positions are defined relative to a physical space within which it has geometric relations to human players. These extrinsic distinctions and relations allow players to form intentions to move the pieces only in accord with the rules governing the types of which they will be tokens. When each of these extrinsic factors slips into place in a way that carries the circular relations of the system, a chess game exists.

Notice how the existence of a chess game seems *essentially* dependent on these extrinsic properties and relations: Were it not for extrinsic factors that have internal relations able to carry the circular identity conditions, the game simply could not exist. If the pieces were not physically distinct, the players would soon lose track of which piece was standing in for each type, and they could not form the proper intentions to play them according to chess rules. If the board did not exist in physical spatial relations to the players, the pieces could not be set up in accord with the rules, and the players could not decide the legality of moves. In other implementations, such as computer implementations, some other set of extrinsic properties always performs the carrier role.

Many more examples exist. A computer's logical components are circular because functional relations between the elements of a system are what define computational elements. As before, computer programs may exist by being carried by physical states that have natures extrinsic within the computational system. As we widen our view to other conceptual systems—economics, biology, and psychology are examples—we see the same pattern repeated.

In economics, what things count as goods and services? To a first approximation, goods and services are those things that consumers and producers barter. Who are the consumers and producers? Consumers and producers, in their turn, are people occupying distinct positions in the system of bartering for the goods and services.

In biology, organisms pass heritable characteristics through their genes. A heritable characteristic is one that parents pass from their generation to later generations. A parent, in its turn, is an organism that passes along its genes, or a significant portion of its genes, to the young.

In psychology, beliefs, desires, and perceptions are at least partially definable in terms of their functional role within the cognitive economy. An entity's functional role is its disposition to interact with other entities in the system.

In each case, a closed or semiclosed system of theoretical concepts exists, many of which are directly or indirectly circularly dependent on one another. This circularity is hardly fatal or even objectionable. The reason the circularity is innocuous is that, in each case, extrinsic properties exist within the systems, and these properties have internal contrasts between them. These contrasts help carry the circular dependencies. In economics, we can find extrinsic carriers by appealing to the desires, needs, and opportunities of individuals in the wider social system of which the economy is part. In biology, we can appeal to the mechanics of molecular biochemistry. In psychology, we can appeal to computational or dynamical properties of neural systems and the way these properties help the organism survive in an ecological niche.

12.3 The Circularity of Physics

Reflections on examples such as these lead one inevitably to concepts with wider and wider spheres of application. In the case of the natural sciences, this expanding arena of circularly looping systems traces the same path as intuitive expectations of reduction. When we look at a circular system of concepts, we find that its instances are carried by objects with properties extrinsic within that system but intrinsic to some other system. Inevitably, these other systems are themselves circular, partially or completely, and thus we find them carried by yet another set of objects with properties extrinsic within them. From economics, we look to social relations of a broader sort, then from those to psychology, ecology, and biology, then to chemistry, and finally to physics.

If this way of looking at things is correct, these higher level domains are not just *in fact* realized by the entities of some other domain, the domain of the carriers, but they *need* carriers to get their foothold on concreteness. The existence of carriers is an essential ingredient, a metaphysical presupposition, for the satisfaction of circularly interdependent systems of categories.

When we reach physics, we find the same kind of circularity as in other, less fundamental, sciences, and the pivotal, required role for carriers raises questions. We can easily see the circularity in physics by asking questions about the identity conditions on the basic physical entities. These conditions are broadly functional. What it is to be a photon, for instance, is to play the functional role in our environment that photons play in physics. What it is to be charge, mass, or spin is to be distinct from the other physical properties and to nomically instantiate the pattern of regularities prescribed by the laws (again, in our environment). What it is to be gravity is to play the role gravity plays, and similarly for the other basic physical properties. As a result, physics incorporates circularity, just as all functional systems do.ⁱⁱ

The circularity of physical concepts leads to the question, *What is extrinsic within physics?* That is, what carries the contrasts and relations needed to satisfy our system of physical concepts?ⁱⁱⁱ Taking a hard line here, insisting that nothing carries the physics, is unprecedented and problematic. It is unprecedented in that the extrinsic properties in other circular systems are not spandrels but elements required for the instantiation of those systems. It is problematic in that the resulting metaphysics seems unintelligible, if looked at too closely. The metaphysics requires a system of contrast, and relations between the contrasts, in which these contrasts have no carriers. Without carriers, it requires a notion of pure contrast, contrasts that seem not to be contrasts *between* anything. The idea seems to melt away before the mind's eye, like an echo issuing from no originating voice. The champion of such a metaphysic takes on a large unmet burden in trying to explain it. Unfortunately, the largeness of the circle in physics makes it easy to overlook the problem, or feel it less vividly, and current philosophy tends not to press the issue. I think the *Life* world makes the strangeness clearer (it is, after all, just a toy physics). Enlarging the circle makes the carrier problem easier to ignore but does not make it go away.

Taking the different tack of answering that physics has no ground level at all—it's turtles all the way down—is conceptually and logically a little less problematic. There perhaps *could* be such a world. The problem with the suggestion as an account of our world is empirical: Planck's constant seems to put a limit on how finely space, time, and matter can be divided. Below that level, there is no sense postulating further physical structure. Our world seems to have a fundamental physical floor.

If there is a physical floor, standards of intelligibility demand that there must be a set of properties that are extrinsic within physics. To find these properties, it will not help to

appeal to some wider *system* of properties or to circle back around in a constructivist way to society or to human psychology. Those maneuvers just enlarge the circle, presenting the same problem again. A proper solution will be one that short-circuits the puzzle, not one that moves it to a new arena. What the world needs from a carrier of physics are properties whose being would be extrinsic within *every* such system and yet which still have the requisite internal relations to one another. For physics, we need *ultimate carriers*.

The properties answering to this description are best thought of as properties that are intrinsic *tout court*. A property whose categorical nature is extrinsic within every *system* of properties is simply one whose being is intrinsic at least partly to *itself* rather than to its contextual relationships. That is, it is a property that we cannot understand in purely systematic terms without leaving something out. The least strained way of understanding the physics of the world is to suppose that some kind of intrinsic property carries each effective property, where we understand intrinsic as intrinsic *tout court*, rather than intrinsic to a system.^{iv} Having come to this end, perhaps it will help to summarize the kinds of properties I have discussed so far:

1. Property intrinsic *to* a system: A property whose identity conditions are given entirely by relations to other entities within some system to which it belongs (e.g., the “on-ness” of a *Life* cell).
2. Property that is intrinsic *tout court*: A property that is not intrinsic to any system (e.g., phenomenal redness).
3. Property extrinsic *within* a system: A property that is present within an instance of a system and that has a nature not exhausted by its relations to other elements as they are defined within that system (e.g., the redness of a checker used to instantiate the “on” property within a game of *Life*).

The carriers of physics will be intrinsic *tout court* and so extrinsic within the world as it is defined by physics. Additionally, to act as carriers of the effective properties described by physics, these intrinsic properties must have internal contrasts with one another that mirror the features and relations of physical properties: patterns of distinctness *within* determinable families, patterns of distinctness *between* determinable families, variations in magnitude, and relations of compatibility, incompatibility, and requirement.

How many carrier candidates can there be? The phenomenal qualities of phenomenal consciousness are perfect candidates.

1. Phenomenal qualities are intrinsic *tout court*: One cannot understand what it is to be phenomenal yellow in terms of a system of relations (that is one of the lessons of the antiphysicalist arguments). Their intrinsicness is plausibly what makes qualia the funny things that they are and what makes full knowledge of them attainable only by acquaintance with them. Formally, their natures are intrinsic in the sense that a phenomenal property is not categorically constituted by the structure of relations into which it enters.
2. The failure of phenomenal properties to ontologically supervene on the physical while still being part of the natural world means that they can plausibly meet the condition of being extrinsic within the physical world.
3. Phenomenal qualities also plausibly support the required kinds of nonstipulative internal contrasts. The differences between phenomenal qualities are grounded in the differences in their intrinsic natures so that, necessarily, if they exist, then the differences

obtain. For example, distinct sounds exist such that, if each exists, then they are necessarily distinct types of sound. It seems like a trivial point, but it is very important.

4. Phenomenal properties fall into natural determinable families such as colors and sounds, with intrinsic patterns of distinctness within and between families.</NL>

The internal contrasts between phenomenal properties are very important because phenomenal properties enter into much more complex internal relations than mere difference or distinctness. Of special importance is that they can possess internal *scalar* relations. Scalar comparisons within (but not necessarily between) phenomenal groups such as colors, sounds, tastes, and so forth come naturally to us. For example, some sounds are louder than others, some colors brighter than others, and some tastes are more sour than others. The most natural way to think of these groups is in terms of phenomenal spaces that they instantiate, with natural orderings of various types between the elements of these spaces along an intensity metric, such as brightness or loudness, internal to the kind of property.

The reality of scalar relationships between familiar phenomenal properties suggests that some other kinds of phenomenal properties, if they existed, could carry the kinds of quantitative variations required by physics. With this in mind, the Liberal Naturalist proposal would be that there are alien phenomenal properties in which an internal contrast between phenomenal quality *A* and phenomenal quality *B* exists such that, when they both exist, necessarily $A > B$ is true along some natural metric. Properties such as *A* and *B* (and presumably other members of the phenomenal group they belong to) may carry the more complex kinds of quantitative contrasts required by physics.

Continuing this train of thought, a variety of compatibility and incompatibility relationships hold between phenomenal properties and possible phenomenal fields. A straightforward case is the postulated red/green incompatibility in our color space.^v Much more subtle and sophisticated kinds of compatibility restrictions also show in experience, restrictions that apply to whole fields or subfields of a phenomenal manifold. For instance, it is not clear that one could simultaneously experience the Necker cube (shown in figure 12.2) as having face up and face down in the same visual manifold. If this restriction holds, then it is a very interesting kind of exclusion relation, one that incorporates the semantics of the conceptualization right inside the formation conditions on the qualitative experience.

The physical explanation of these incompatibilities in terms of opponent processes in the brain does not undermine or compete with the hypothesis that the phenomenal properties have these intrinsic relations. If phenomenal properties carry effective properties, then it is ultimately these intrinsic relations between the phenomenal properties that form the basis for the opponent behavior described by physical theory. The physical theory is a reconstruction of the results of the carrier's causal behavior from an external and structural point of view. It is as if the natural individuals were objects thrown at one side of a curtain, with us on the other side, and against which we can only place our hands and feel the impacts. Our physical descriptions explain the patterns of indentation in the curtain by supposing the objects to have certain shapes and compatibilities, but we are blind to the substantial nature of the objects.

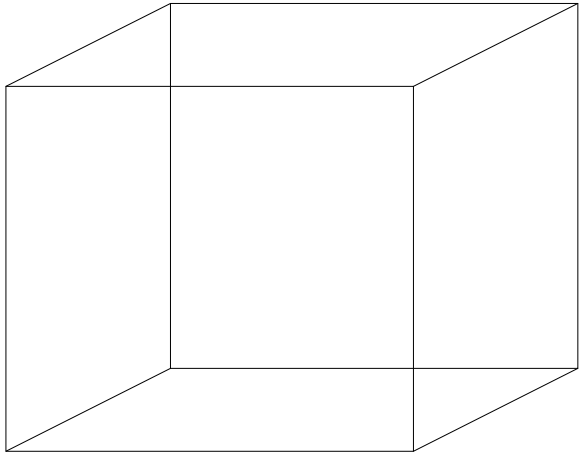


Figure 12.2 The Necker Cube. Notice how the two perceptual interpretations of its orientation seem to exclude one another.

Also, certain phenomenal properties might necessitate other phenomenal properties. For example, colorless instantiations of shape might be impossible, so the existence of a shape property might necessitate the existence of a color. On an even finer grained level, one might postulate that the existence of a hue necessitates the existence of a brightness value (no hue without brightness). In the gap

between simple red/green incompatibility and the very subtle Necker cube face up/face down incompatibility, there might be a whole host of subtle and interesting relations of exclusion, compatibility, and necessitation between possible kinds of phenomenal properties. These kinds of relationships would be needed by a carrier that could drive the effective side of causation, as it is these relationships that would carry the natural possibilities, impossibilities, and necessities of physics.

A note of caution: The Liberal Naturalist claim would *not* be that the phenomenal qualities of human consciousness exist at the microphysical level, carrying the effective dispositions of microphysical entities. The Liberal Naturalist hypothesis here would be like the panexperientialist hypothesis: that alien phenomenal intrinsic properties exist, properties in an abstract sense like the qualia of our own consciousness, that carry the effective dispositions of the world's basic natural individuals. Perhaps these phenomenal properties are to our experienced phenomenal properties as brightness, hue, and saturation are to a full-fledged color. Perhaps the qualities at each level are irreducible. In no case are qualities of the mind purported to exist in nonmental contexts.

The abstract sense that the alien qualities would be like the qualities of our consciousness would come to precisely this: They would be intrinsic *tout court*; they would be determinables and belong to families of determinables; they would share both simple and sophisticated internal contrasts with one another; and they would have intrinsic relations of compatibility, incompatibility, and inclusion.

The ways they would be different from the qualities of our consciousness would be these: Their specific characters presumably would be entirely different from those of our own qualia; the internal contrasts that hold between them would organize them into very different kinds of phenomenal subspaces; and they presumably would not be appropriate vehicles for representation and thought.^{vi}

But there remains one last foreboding question about the similarity of these proposed phenomenal qualities to the qualities of our own conscious experience. Would these alien qualities be *experiential*, like the qualities of our own consciousness?

12.4 The Experiencing of Phenomenal Individuals

The physical properties are the effective properties, so by proposing phenomenal carriers for the physical properties, we would account for one-half of the nomic content possessed by natural individuals. The other half of their nomic content is the irreducible receptivity in their nature, which binds effective individuals, thereby creating causal nexii. What carries receptivity?

Physics suppresses the receptivity of the world in its theorizing and thereby leaves out its receptive structure (chapter 11). The addition of receptivity to the effectiveness of physics brings a compositional circularity into the causal character of the world, magnifying the problems that arise merely from the circular contrasts of the effective properties alone. An individual's nomic content as a whole,

not just the effective aspect of it, needs to be carried, so receptivity needs a carrier as well. My fundamental proposal is that receptive properties are carried by inherently experiential properties: *Experiencing itself carries receptivity*. This is the central thesis of the Carrier Theory of Causation:

The Central Thesis: Things in the world are natural individuals if, and only if, they are capable of experiencing phenomenal individuals.

The ontology implicit in the Central Thesis is a panexperientialist neutral monism. The fundamental kind is the causal nexus itself, and the nexus has multiple aspects: a phenomenal side, consisting of intrinsic properties that carry the components of the world's effective constraints, and an experiential side, to which the phenomenal natures are bound and through which they place their contributions to constraints. The Carrier Theory implies that neither experiencing nor phenomenal individuals are entirely physical because carriers are extrinsic within physics. They are nevertheless not epiphenomenal, nor do they interact with the physical. A variety of panexperientialism, as discussed earlier, also holds if the Central Thesis is true.

The discussions in chapters 5 and 6 show their bite here. Any natural individual is at least protoconscious: It is an experiential nexus even if it does not support thought. To avoid panexperientialism at this point, we would have to retract the proposed Central Thesis and assert a different form that covered the cognitive case (making it experiential) and that separately covered the rest of the world (making it nonexperiential) and ideally accompany it with an explanation of the discontinuity or continuity between the two. To characterize the two disjunctive conditions, we would have to overcome the obstacles discussed in chapter 6: We would have to explain why the experiential emerges in just the "right" contexts. The effort would invite a tremendously difficult theoretical problem whose result likely would be replacing the simple, straightforward Central Thesis given here with a much more complicated version.

The only motivation and the only payoff for that effort would be avoiding panexperientialism. How justified would the effort be, given just this motivation? I think earlier reflection has shown that this would be much effort for little return in the grand scheme of things. As the arguments in chapter 5 for the possibility of panexperientialism showed, we do not *know* that panexperientialism is false, so there would be no established facts driving the effort to complicate the Central Thesis.

At worst, panexperiential consequences are counterintuitive. Yet this is a fundamental theory, and science has already shown us in many ways—from the relativity, responsiveness, and surprising geometry of space and time to the randomness, state indeterminacy, nonlocality, and uncertainty principle of quantum mechanics—that commonsense intuition breaks down at the fundamental level of the world where the Central Thesis holds. Therefore, this kind of counterintuitiveness does not mean much when judging a fundamental theory such as the Carrier Theory of Causation.

Finally, it is not even clear in what sense the intuition against panexperientialism really is a *commonsense* intuition. Many other cultures have seriously entertained or endorsed an animistic metaphysics, and it is certainly possible that the current resistance to distantly related views such as panexperientialism is at least partly a knee-jerk reaction against these more primitive or theistic views. If so, the intuition against panexperientialism is not so much one of common sense but one of a specific cultural time and place. Perhaps some of it is rooted in a natural and admirable aspiration for sophistication as measured against a more primitive and superstitious past. However, we have to force ourselves to realize that there is nothing primitive or superstitious about the Central Thesis. Quite the contrary, in context it is a sophisticated proposal motivated by an unflinching adherence to modern standards of rational explanation.

It seems the reasons for outright rejection of the Central Thesis are weak. But why believe in the Central Thesis? Some strong reasons exist for adopting it. Whatever carries the nomic content of a natural individual must conform to the following:

1. They are intrinsic properties that are intrinsic *tout court*.
2. These properties must have the structural characteristics needed to carry effective and receptive properties.
3. The effective carriers must be determinables with the right kinds of internal contrasts among them, as well as relations of compatibility, incompatibility, and inclusion.
4. The receptive carriers must be neutral essences with a kind of inherent openness to their nature that can be filled by determinable properties.
5. Each of the receptive and effective carriers must have natures that are dependent on the nature of the other in the compositionally circular way that effective and receptive properties are dependent on one another.

In section 12.3, I preemptively discussed conditions 1 through 3 by defending the qualifications that make phenomenal properties good carrier candidates for effective properties. What of conditions 4 and 5? The experiencing subject is a good candidate for a receptive carrier that meets condition 4. In its normal state, the experiencing subject shows itself to be intrinsically plastic, suggesting a kind of neutrality, by binding and re-binding a vast variety of phenomenal properties, opening itself to a carnival of combinations and determinations of properties from the phenomenal world. Furthermore, the idea that experiencing is a kind of openness to phenomenal content coheres with common phenomenological reports about meditative states in which people are denied normal sensory input. In a physical state of sensory isolation, these meditative experiencers consistently report achieving a mental state that they identify as “pure” awareness in which consciousness is perceived as possessing a kind of contentless openness.

That leaves condition 5. Condition 5 is necessary because phenomenal properties, if they were just intrinsic *tout court*, lying next to one another in a Humean way, could not carry effective causation. The relationship between the effective and receptive aspects of an individual must be metaphysically intimate. For properties to be *effective*, they must presuppose receptive connections as *positive* components in their own being and vice versa. In the relationship between effective and receptive causation, receptivity penetrates the being of effective properties, occurring as a presupposition in the very notion that they are effective. Furthermore, the logical intimacy between effective properties and receptivity plays an important metaphysical role. Through the intimacy of binding, the effective states of different individuals penetrate one another’s being and present their constraints immediately.

In a sense, having a shared receptivity provides a principle of substantial unity that activates the relations of requirement, compatibility, and incompatibility between effective properties, making these internal constraints between them relevant in specific ways to specific cases.

Plausibly, the ontological relation between phenomenal qualities and their participation in the experiencings of subjects matches this crucial logical structure of the relationship between effective properties and their shared receptivity. Focusing first on the phenomenal side, the phenomenal qualities of our consciousness seem to depend for their existence on entering into the experiences of a subject. Think of the paradox of unity. It is highly implausible, for example, that kinds of pain could exist for which there is no subject to experience them. If this is right, its possible role in experiencings is essential to pain. As for experiencing itself, claiming that something is an experiencing subject implies that it can experience phenomenal qualities. That is, its capacity to host and experience phenomenal being is essential to it.

Questions about the relations between the experiencing subject and its experiences raise many complicated and controversial issues. I do not have space to go into much here, but I do propose that phenomenal qualities could not exist unless some subject was experiencing them^{vii} and that experiences could not exist unless they were experiences of phenomenal qualities. Yet, despite this mutual participation in one another's natures, they are distinct essences. A phenomenal quality is an *object* of experience that should not be identified with the experiencing of it. And an individual experiencer is a subject of qualitative experience that should not be identified with its objects. So, just like effective and receptive properties, the experiencer and the experienced qualities constitute distinct yet interdependent aspects of the total individual.

Receptive fields and the content of experience Recall that an individual's *receptive field* consists of the other individuals from whom it is directly receiving constraint. If the Central Thesis is correct, individuals experience the phenomenal carriers of the effective properties belonging to individuals in their receptive fields. Figure 12.3 can help us to visualize what this means for the experiencing of an individual.

Definition 12.4: The *receptive field* of an individual $I_{n,k}$ consists of all the individuals $I_{n,x} \dots I_{n,y}$ (1) with which it shares a receptive connection and (2) where it is on the receiving end of constraint with respect to that individual.

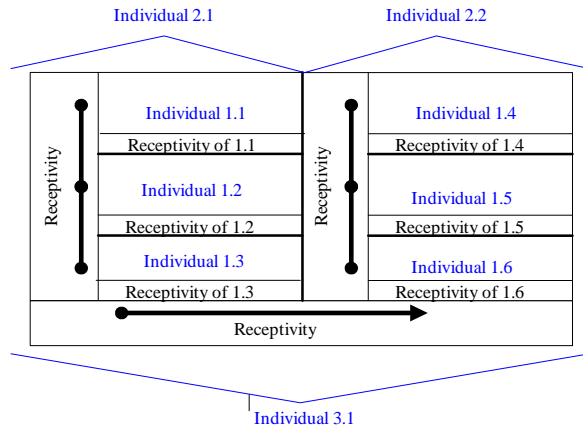


Figure 12.3 A representation of a complex individual. The highest level individual is at level three. It has an asymmetric connection between two level-two individuals, each of which symmetrically binds three level-one individuals. The receptive field of each individual includes the effective properties of the individuals directly constraining it. According to the carrier theory, an experiential property carries each individual's receptivity, and so the individual experiences the phenomenal properties that carry the effective properties in its receptive field.

Figure 12.3 depicts a compound level-three individual, labeled Individual 3.1. It consists of two asymmetrically connected level-two individuals, labeled Individuals 2.1 and 2.2. A beaded arrow representing the asymmetric receptive connection between these two individuals is drawn below them. The level-two individuals each consist of three level-one individuals. Two lines, each with three beads, are drawn within the receptive connections of these individuals to symbolize the symmetric receptive connections between their members.

By identifying these individual's receptive fields, we can work from the bottom level up and use the carrier theory to hypothesize experiencings for the individuals in the figure. At level zero, the individuals do not have receptivities of their own, so they could not have receptive fields and so could not experience.

Individuals 1.1 through 1.3 do have instances of receptivity belonging to them, and they also share a symmetric receptive connection within Individual 2.1. Because the connection is symmetric, each of the individuals in this nexus has the other two in its receptive field. For example, Individual 1.1 has individuals 1.2 and 1.3 in its receptive field. The effective state of each individual *realizes* one or more *effective properties* as described in chapter 10.

If the Carrier Theory of Causation proposed in this chapter is correct, these individual's effective properties are carried by phenomenal properties, and an experiential property carries each individual's receptivity. Individual 1.1's receptive carrier would enable it to experience the phenomenal carriers associated with the effective properties of individuals 1.2 and 1.3. Similarly, Individual 1.2's receptive carrier would allow it to experience the phenomenal carriers associated with the effective properties of individuals 1.1 and 1.3, and individual 1.3's receptive carrier would allow it to experience the phenomenal carriers associated with the effective properties of individuals 1.1 and 1.2. These relations are laid out in the table below.

Experiencing Individual	Individuals within its receptive field	Experienced qualities
Individual 1.1	Individual 1.2, Individual 1.3	The carriers associated with the effective properties of individuals 1.2 and 1.3.
Individual 1.2	Individual 1.1, Individual 1.3	The carriers associated with the effective properties of individuals 1.1 and 1.3.
Individual 1.3	Individual 1.1, Individual 1.2	The carriers associated with the effective properties of individuals 1.1 and 1.2.

The analysis of individuals 1.4 through 1.6 that are constituents of Individual 2.2 would be exactly similar. Notice, however, that the individuals within the two groups do not experience one another's carriers across the boundaries of their own nexii. Because carriers rely on transitivity to deliver their constraint, they only penetrate other individuals within the context of a shared receptive connection.

Level two presents an asymmetric case of experiencing. Individuals 2.1 and 2.2 are asymmetrically connected, and so Individual 2.2 is open to constraint from Individual 2.1 but not vice versa. Therefore, Individual 2.1 is in the receptive field of Individual 2.2 but not vice versa, and Individual 2.1 does not reciprocally experience Individual 2.2's phenomenal carriers. Finally, when we ascend to level three, we see that Individual 3.1 has the potential to experience, but, as the topmost individual, it is not bound within any higher level individual. To have a receptive field, and therefore to have phenomenal carriers to experience, it would have to be in a constrained slot of a shared receptive connection within a higher level individual. Therefore, it has no receptive field. Consequently the level three individual is not an experiencer.

We have nested experiencers here that look something like the Russian-dolls metaphor from chapter 4: There are experiencers within experiencers. However, the top- and bottom-level individuals do not experience. The bottom-level individuals (level zero) do not experience because they have no receptivity belonging to them, and the top-level individuals (level three) do not experience because

they do not belong to causal nexii from which they can obtain a receptive field. The individuals in the middle levels do experience.

12.5 Summary

Table 12.1 shows the requirements on the carrier role for natural individuals and how the experiencing of phenomenal individuals fills the bill. The next chapter discusses a host of more detailed and striking parallels between the observed character of experience and what one would predict for the character of carriers. For now, the high-level mapping goes like this.

Experiential property → Receptivity

Phenomenal qualities → Effective properties

Experiencing of qualities → Reception of effective constraint

Experiential nexus → Causal nexus

Table 12.1 partially details how the carrier relation is implemented.

Phenomenal properties (feature of the proposed carrier)	Nomic content (structural requirement on the proposed carrier)
1. The possibility of being experienced is essential to phenomenal qualities.	1. The possibility of being receptively bound is essential to effective properties.
2. Being an experiencing subject implies the experiencing of phenomenal qualities.	2. Being a receptive individual implies receiving the constraint of effective properties.
3. Phenomenal qualities are only potential unless actually being experienced.	3. Effective properties are only potential unless actually receptively bound.
4. Experience is only potential unless it is experiencing phenomenal quality.	4. A receptive connection is only potential unless it is binding effective properties.
5. Phenomenal properties are determinables.	5. Effective properties are determinables.
6. Phenomenological reports of the “pure” experiencing subject reveal a kind of contentless openness within pure consciousness.	6. Pure receptive connections are a kind of contentless openness.
7. Relations of inclusion, exclusion, compatibility, and incompatibility exist between phenomenal properties.	7. Relations of inclusion, exclusion, compatibility, and incompatibility exist between effective properties.
8. Scalar relations and relations of intrinsic difference exist between phenomenal properties.	8. Scalar relations and relations of stipulative difference exist between effective properties.
9. Despite mutually participating in one another’s nature, phenomenal properties and the experiencing of them mark distinct essences.	9. Despite mutually participating in one another’s nature, effective properties and the receptive binding of them mark distinct essences.

The Central Thesis solves the carrier puzzle quite neatly and fruitfully, and that is its best defense. It turns out that the causal nexus has three aspects: its effective dispositions, its receptive dispositions, and the carriers of this nomic content. The effective and receptive dispositional properties are the two complementary aspects of causation that give natural individuals their nomic content, and these two aspects are carried, ultimately, by the experiencing of interlocked subjects within the causal mesh.

Physical theory *specifies* some constraints between the effective states of the basic natural individuals by describing the nomic regularities that hold between their instantiations. One might argue (e.g., Stoljar 2001) that physical specifications indirectly *designate* phenomenal properties that are involved in carrying these effective constraints. When combined with the Theory of Causal Significance and the Carrier Theory, physical theory *suggests* the existence of protoconscious experiencers at many levels of nature.

The Central Thesis does have a price of admission, and that price is its implication that some kind of panexperientialism is true of our world. Just how widely spread experience is remains to be discovered, as the question of which individuals are the natural individuals is a substantial and important scientific question. However, as I argued earlier, we should have expected to arrive at some kind of panexperientialism, and this kind of panexperientialism is a *benign panpsychism* because experience is likely to be very simple in the vast majority of cases, to be restrained to highly specialized circumstances despite its outrunning cognition and to be qualitative content unaccompanied by thought whenever it exists outside of cognitive contexts. Putting panexperientialist implications aside, the final question is just this: How does all this help with understanding human consciousness?

<FN>ⁱWhen I speak of “categorical natures,” I mean the kind of thing conveyed by an appropriate answer to the question, “What is it to be *X*?” for the property of being *X*, or “What is it to be an *X*?” for the property of being an *X*.</FN>

<FN>ⁱⁱ When making this claim, I do not wish to deny the importance of indexicality (i.e., designation) in fixing reference. Likely, physical concepts contain indexical components, as “electron” may express a rigid designator. As Daniel Stoljar has pointed out, electrons are arguably just the categorical natures that play the electron role in our world. The more important point is that, even if some categorical nature is picked out indexically by these concepts, the indexical place functions much like a variable in the conceptual structure. Even if the value of the index anchors the language system to categorical natures, and even if it does so in a way that depends on the deictic orientation of the concept user within its physical context, it is still functional roles that do the most essential work in fixing the *physical category* applied to that nature. The indexically designated nature is a nature that is otherwise *extrinsic* to these entities, relative to the system of physical concepts we employ in science. That is, these natures, if they exist, are extrinsic within the system of physical dispositions they are carrying.</FN>

<FN>ⁱⁱⁱThis constitutes yet a third argument against physicalism, distinct from the failures of consciousness and causation to ontologically supervene. The facts about the natures of the carriers do not ontologically supervene, either.</FN>

<FN>^{iv}Related arguments from the circularity/schematic nature of the physical to this conclusion are in Fales (1990), pp. 219-220, and Chalmers (1996), pp. 303-304.</FN>

<FN>^vKneale (1949) also uses red/green incompatibility as an example of a *de re* incompatibility between properties, proposing that it might serve as an analogical model for relations between physical properties. My suggestion in the text goes beyond Kneale in several ways, chiefly in taking the panexperientialist step of

suggesting that they may serve as more than merely a model, and also by proposing the more subtle variety of relations I discuss in the text.</FN>

<FN>^{vi}This discussion is making partial payment on the promissory note at the end of chapter 5.</FN>

<FN>^{vii} Not everyone agrees. See Lockwood (1989) for a different view.</FN>

This document was created with Win2PDF available at <http://www.daneprairie.com>.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.