Central to Wilfrid Sellars’ philosophical system is his belief that science’s current ontology is inadequate as it fails to provide for an acceptable account of perceptual experience. Unfortunately, this remains the most puzzling plank in his philosophy. Sellars himself argues for this position via his well known pink ice cube example and its homogeneous color.\(^1\) This homogeneity, says Sellars, bars the acceptance of science’s present ontology of achromatic particles, and requires the introduction of items which are truly colored. Only with such a revised and expanded ontology, with all that entails, can science adequately meet its explanatory demands.\(^2\)

I aim here to remedy at least some of the confusions and misunderstandings this position has engendered. But I mean to take a different route than Sellars. In short, given the problems with Sellars’ views on homogeneity, I will argue for the Sellarsian conclusion as to the inadequacy of present scientific ontologies, yet without reliance on the puzzling doctrine of homogeneity.

I begin then with a detailed examination of Sellars’ official position, indicate the trouble spots, and begin an alternative route. As I conceive things, however, the position I will sketch is still thoroughly Sellarsian for it proceeds from premises Sellars himself has endorsed.

I. The Problem

At the heart of Sellars’ philosophy lies the conflict and interplay between two idealized ways of thinking about the world, the manifest image and the scientific image. The manifest image maps roughly, but only roughly, onto our common-sense understanding of how things are. Roughly, because the manifest image is not just common-sense, but common-sense as it is revised, improved, and clarified by both philosophy and science. What makes the manifest image's use of science

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2. Once such colored entities are admitted, a global revision of the scientific ontology is required. In essence, what is needed is the move from a particulate based ontology to one of processes. For an account of how all the pieces fit together, see Rosenberg’s “The Place of Color in the Scheme of Things: A Roadmap to Sellars’ Carus Lectures”. And for an account of what a process ontology might look like and how it can be used, see my “Absolute Processes: A Nominalist Alternative”.

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different from the scientific image's is that the former excludes the enterprise of postulating imperceptible entities, while the latter offers an account of how things are which makes use of such entities.

Now since both images purport to be the true account, one is forced, in Sellars’ view, to choose one or the other. Here the issue of color provides an important example of how complicated the choice is. The most familiar way to introduce the problem is by noting that according to the manifest image reality is occurrently colored; trees, tables, etc. have color (and other proper sensibles), independently of our perceiving them, and in more than a merely dispositional sense. The scientific image, as parsed by Sellars, on the other hand, tells us that color is mere appearance. Tables are not occurrently colored, for there is no such thing as occurrent color. All that really exists, says that image, are the microparticles that physics countenances; particles with their primary (-like) qualities.

What makes this situation especially acute is that for scientific realists like Sellars, science is the measure of all that is and is not. Accordingly, our ultimate ontological commitments and beliefs in what really exists stem from our best scientific theory. It seems then that we ought to accept the scientific image and simply deny that occurrent colors exist. But such a denial leaves such nagging questions as to why we think the world is colored if it really is not? And just what is it to say color

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3 For a view of how the two perspectives might in fact be compatible, or at least that we are not forced to choose, see Strawson’s “Perception and Its Objects”. Putnam (The Many Faces of Realism) offers another way to view the matter, namely that what really exists in ‘internal’ to each of the images, and that there thus need be no conflict between them.

4 Here, perhaps, is the place to locate many of Sellars’ opponents. On the one hand there are those (Cornman, Perception, Common Sense and Science) who simply reject the view that color is mere appearance, arguing instead that it is a genuine, occurrent quality which characterizes physical objects. Others would seek to establish that though color is not an occurrent property of macro-physical objects that does not entail it is mere appearance. There are a host of views that fall under this heading. They range from those who maintain color is to be identified with a disposition or power of objects to induce in us experiences of color (Armstrong, Perception and the Physical World) to those who seek to identify color with wavelengths of light. This latter position in turn unfolds into a straightforward identification of color with wavelengths along Newtonian lines, or, alternatively, that color is to be identified with those wavelengths which are reflected from various objects (Westphal, Colour: Some Philosophical Problems from Wittgenstein). Campbell’s “David Armstrong and Realism about Colour” provides an nice overview of the various possible positions and strategies. Hardin’s Color for Philosophers is equally valuable for grounding the debate in scientific research on color phenomena.

It is clear that nearly every claim advanced by Sellars on the topic of color is controversial. Ideally an explication and defense of Sellars would include not only motivation and argument for his view, but arguments against the other strategies for dealing with color. Such a complete enterprise would, obviously, go beyond what can be covered in one paper. For now what is important is that however these other positions are developed, they all deny that there is a place for occurrent color within the ontological framework advanced by the scientific image. It is that thesis Sellars seeks to rebut.
is *mere appearance* anyway?

Sellars’ struggles with color revolve around a particular feature of color within the manifest image, its non-gappiness, or homogeneity. Sellars argues that it is the non-gappiness of color patches and pink ice cubes within the manifest image which bars the acceptance of a scientific ontology of achromatic particles which occur in gappy aggregates. Accepting such an ontology would force us to identify the homogeneous items of the manifest image with such gappy items, an identification Sellars deems illicit.  

It does not seem plausible to say that for a system of particles to be a pink ice cube is for them to have such and such imperceptible qualities, and to be so related to one another as to make up an approximate cube. Pink does not seem to be made up of imperceptible qualities in the way in which a ladder is made up of being cylindrical (the rungs), rectangular (the frame), wooden, etc.  

With these broad brushstrokes in place, I turn to a detailed examination of Sellars’ views, while at the same time developing the dialectic in a way which will allow us to bypass Sellars to a more satisfactory position. Thus even while I am trying to make sense of Sellars' talk of homogeneity, my larger goal is to develop a position which *doesn't* turn on such notions.

II. Sellarsian Sense Impressions

An intermediate Sellarsian conclusion provides a nice entry point: Within the fully articulated and developed manifest image, colors are *not* properties of objects. Rather, they are states of perceivers. According to this position, the ultimate ontological story of what color is within the *manifest* image is that of states of perceivers.

A natural move by a proto-theory which is uncontaminated by the Myth of the Given would be to hold that in perception items which in point of fact, for example, quasi cubes of pink stuff (of-a-cube-of-pink-stuff states of a perceiver) are conceptualized (i.e. responded to perceptually) as cubes of pink stuff simpliciter having the causal properties of ice.  

[T]he volume of pink of which we are aware does not present itself to us as a sensory state of ourselves-

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5 As we shall see, just what is to be identified with what is more complicated than I have so far presented it.
7 Sellars, CLI, §97.
even though, at the end of a long (and familiar) story, that it is what it turns out to be.\footnote{Sellars, CLIII, §14. Considerable care, however, is required here in interpreting Sellars on this point. On the one hand, we are told that the only things which could be colored are physical objects. It is part of the grammar of color that it applies only to objects. See, for instance, his “Phenomenalism”. However, Sellars also indicates, as illustrated above, that colors are manners of sensing, sense impressions. That would be to suggest that color, properly conceived, is not a property of an object but a state of perceivers. Yet, finally, Sellars also argues that the ‘color’ of sense impressions is merely analogical to the color of physical objects. What exactly then is the story? I take the situation to stand as follows, which will be developed in more detail below. Common sense, untainted by any philosophical reflection, takes objects to be colored; color is initially conceived as a property of objects. Under pressure from the Argument from Illusion we must, still within the Manifest Image, reconceive matters. We end up saying that what answers to our pre-theoretical intuitions about color is really states of perceivers. Strictly speaking then, there is no color, for the only thing which could be colored would be physical objects. But we are forced to conclude, from within the manifest image, that they lack color. Yet what does the explanatory work for the \textit{appearance} of color is states of perceivers. Crucially, the content that we use to characterize these states is derived from physical objects. We construct our concepts to characterize the nature of sense impressions by analogy with the concepts we are familiar with concepts of the colors of physical objects, though it turns out, from the ontological point of view, that there never really was any color in those objects. For simplicity, I will speak on occasion of color as a state of perceiver, acknowledging that this phrase is elliptical for the \textit{analogical} sense of color of sense impressions and how such sense impressions provide the proper ontological ground for the appearance of colors of physical objects, with which the story begins.}

And it is the homogeneity of these color-states, says Sellars, which itself bars \textit{their} identification with states of aggregates of achromatic particles of the scientific image. Again, it is the homogeneity of the former which causes trouble were we to accept the gappy scientific image as it now stands.\footnote{Just making sense of just what a homogeneous state is is part of the problem in understanding Sellars’ view. Later sections of the paper aim to remedy this problem by essentially leaving behind talk of homogeneity.}

I enter the complicated dialectic by examining Sellars' claim that in the manifest image, sense impressions are introduced to explain, among other things, how Jones can take there to be a red object in front of him when in fact there is none. More specifically, my focus will be the claims that sense impressions, 1) provide the key to understanding the ontological status of color within the manifest image, and 2) are not particulars. Regarding (2), sense impressions are states of perceivers, and their introduction does not involve the postulation of a new domain of entities: before and after their introduction, the only particulars are persons and physical objects. As for (1), while sense impressions, e.g. a state-of-sensing-pinkly, are modeled on particulars such as pink ice cubes, and are characterized as quasi-stuffs, they are not cubical volumes of \textit{pink}. Just the same, if anything really corresponds to our pre-philosophic theory of colors, it is some aspect of sense impressions. We might put this by saying that colors really live in the categorial guise of sense impressions.

We approach the problem of constructing \textit{new forms of concept} not by throwing away concepts of the...
colors of physical objects, but by transposing our concepts into a new key.\textsuperscript{10}

Perhaps the easiest way to bring out the dialectical importance of the point that sense impressions give us the ultimate place of color within the manifest image, and that the 'theory' which introduces them is not ampliative (introducing new particulars) but interpretive (introducing new forms of concepts) is to see what happens if we ignore these points.

Following Sellars, let us begin where we notice that Jones responds to the presence of pink ice cubes with judgments of the sort, "Lo!, there's a pink ice cube in front of me", and that Jones on occasion makes the same judgment when in fact there is no pink ice cube before him. We must explain how it can seem to Jones that this is the case, when in fact it is not; and our explanation must cohere with our account of how it can seem to Jones that there is a such a cube before him when in fact there is. Sellars' move, one we find through such familiar essays as "Empiricism and the Philosophy of Mind" and "Phenomenalism", is that the proximate, immediate stimulus of Jones' conceptual response about objects in space is in fact a state of himself, the stimulus of which can be standard and non-standard conditions alike.

The upshot of this is that the proximate reality which answers to what Jones conceptualizes as 'out there in space' is really an aspect or feature of himself; i.e. a state of himself. In historical perspective, Sellars is thus rather Cartesian about colors (their esse is sentiri); and he is rather Humean as well ('the mind spreads itself upon the world'). However, these states are not, literally colored (nor shaped). Rather, they are analogous to the colors (and shapes) of physical objects (which were used as models for our concepts of these sense impressions). That is, in devising our 'theory' of sense impressions, states are characterized by analogy with the physical objects we initially (and erroneously) take to be colored.\textsuperscript{11}

That is, as we initially conceive of objects- in our pre-philosophical moments- they are colored. Color is a property of objects, a property that exists independently of our perceiving.\textsuperscript{12} In the order of knowing that is, color is first and foremost a property of objects. But under pressure

\textsuperscript{10} CLI, §86.

\textsuperscript{11} “Colors as manners of sensing form a logical space modeled on colors as attributes of the physical objects of the Manifest Image.” Sellars, “Science, Sense Impressions and Sensa”, p.408.

\textsuperscript{12} A full account of Sellars' views would also include his belief that adjectival predication, i.e. 'That object is pink' amounts to the claim that pink is a stuff and ingredient of that object. Pink then is to be understood, in its most basic sense, not as a property of physical objects, but as a stuff of which objects are made. (See CLI, in particular §48-62 and §77-95.) For our purposes we may safely ignore this complication.
from such phenomena as unveridical and hallucinatory experiences, experiences which present themselves and in some sense are just like veridical experience, we recognize that in the order of being, color is not a property of objects but must be somehow a state of ourselves. The question remains as to how we should understand color so conceived.

It is here that we introduce the notion of concepts by analogy. We conceive of color qua state of perceivers by analogy with color qua property of objects, color qua our primary conception. Where color really lives then is as a state of the perceiver, though we systematically err in responding to this state- and thus believe that there exist colored objects in space.

Sense impressions then are states of perceivers, and are to be thought of as analogously colored. We have 'conceptually moved', that is, in the order of knowing, color from spatially extended objects to states of perceivers, by putting that color in a new categorial 'form' (i.e. a state). To use Sellars' metaphor, we have changed color's categorial key.

The next stage of the Sellarsian dialectic begins as we attempt to reconcile the claims of the manifest image with those of the developing scientific image. Within the manifest image, perceivers have or are 'in' color-states. Allowing the intuitive move of equating state-talk and property-talk, Jones' being in a state-of-sensing-pinkly amounts to it being true of Jones that he has the property of sensing-pinkly. And this property, again, is to be understood as analogous to the pinkness of a physical object.

The clash of the images occurs because within the scientific image perceivers are thought to be but aggregates of more basic particulars, while those particulars are said not to have any occurrent property interestingly analogous to the color of physical objects. What then should we

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13 "Thus, the sense impression inference is an attempt to account for the fact that normal perceivers have conceptual representations of a red and rectangular object both
   (a) when they are being affected in normal circumstances by a red and rectangular object; and
   (b) when they are being affected in abnormal circumstances by objects which have other, but systematically related characteristics." Sellars, Science and Metaphysics, p.17.

14 We should not say, 'sense impressions are colored', for that intimates that the color is somehow separable from, and is just an appendage, to the sense-impression. Instead, colors are sense impressions, in that we are making a claim about their categorial status within the manifest image.

15 To be exact, the full predicate should have a shape sortal as well, e.g. Jones is in a state-of-sensing-cubical-pinkly, to capture what Sellars calls the 'seamlessness' of our experience.

16 Though it will become clearer in later sections just what it means to speak of a quality being analogous to color, we can say now that this turns on the newly conceived quality preserving the essential logical properties of the color from which it was derived. In short, this amounts to the 'new' quality preserving the betweenness relations which characterized the color with which we started.
do with the color with which our story began, as we try to identify the perceivers of the manifest image with the scientific image's aggregates of achromatic molecules, atoms, etc? The manifest image insists color exists, the scientific image (as it currently stands) demurs. How should this conflict be resolved? 

Now if we forget (or ignore) the dialectic so far reconstructed, we may be tempted to identify the pinkness of the ice cube, somehow, with the items of the scientific image (i.e. colorless particles). And there are various ways to proceed in this attempt. On the one hand, one might try to identify the pinkness of a pink ice cube with a family of relations and attributes among the more basic particles which make up the ice cube. Or one may wish to identify the ice cube's pinkness with an indefinable 'holistic' attribute of those basic particles.

An instance of this general strategy can be found in van Fraassen. Consider the following:

It seems to me that the manifest pink ice cube, being itself neither definitely continuous nor definitely granular, can consistently be identified with the objects of various alternative theories, including aggregates of H$_2$O molecules.

For present purposes we can safely ignore van Fraassen's worries over the continuity of the pink ice cube. What cannot be ignored is his gesture towards the possibility of identifying the pink ice cube with aggregates of molecules, or other alternatives.

The problem with van Fraassen's move should be clear. For he proposes to accommodate the color of the manifest image by seeking to identify something(s) from the scientific image with the pinkness of a pink ice cube. But as we have seen, what corresponds to our common-sense theories about color is not some property of the ice cube- rather: colors turn out to be states of perceivers. Color's true categorial location is, within the manifest image, a state of the perceiver. So, there is no color out there in space to begin with, and a fortiori there is no color 'out there' which requires identification with aggregates of molecules, holistic attributes or anything else within scientific image.

There is, however, the question of how to identify the ice cube, conceived now in the manifest image as an object without such proper sensibles, with the items of the scientific image.

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17 What makes Sellars' position so complicated is that at bottom, as said, he is a scientific realist, and thus his ontology is dictated by science. But there are philosophical, or at least explanatory, demands on what counts as adequate scientific theorizing. The Sellarsian position I'm explicating holds, in essence, that the phenomenon of color is one case where science at present has not met its explanatory requirements.

18 Sellars dubs this the genus of Reconciliations, CLIII, §21-33.

But this is a different project (and in all likelihood a far simpler one) from reckoning with the color initially conceived to be a property of the ice cube. So, the reconciliationist strategy appears as a live option only if we have missed the Sellarsian dialectic which introduced sense impressions as providing a story of color's reality within the manifest image; a reality in the guise of states of perceivers.

Moving on, the apparently obvious next move would be to attempt to do with persons what one would properly do with objects of the manifest image. That is, if manifest image objects (minus the color which has been relocated) can be unproblematically identified with aggregates of colorless particles of the scientific image, why cannot we identify color-states of perceivers with states of aggregates of achromatic particles? Why this strategy is ultimately erroneous lies at the heart of the matter. I will postpone a discussion of this until later, though I hope to have already indicated the direction I will take. In short, with color nowhere in the picture it is simply mystifying how we come to experience color, talk about it, and believe it exists in the first place.

We've now surveyed one way in which one can miss the dialectical importance of Sellarsian sense impressions: that there exist color-states of perceivers (i.e. sense impressions), and that that is the true ontological category in which to locate color. There is yet another significant way in which one can miss their dialectical importance. This would be to forget that sense impressions are not particulars, but rather are states. If one were, contrary to Sellars, to think of sense impressions as particulars, and of their use in explaining perceptual judgments as the introduction of a new domain of entities, then the properties we ascribe to these entities will be those required to adequately explain the explanandum.

Here one might think, that is, that sense impressions, as this domain of new particulars, need not have any properties interestingly analogous to the color of physical objects in order to explain perceptual judgments. In this case, sense impressions themselves need not be qualitied in any interesting sense and the subsequent identification of persons and their sense impressions with achromatic particles of the scientific image would be quite easy. The road to what we might call 'Colorless Scientific Realism', would be unproblematically open to us.

At this point what is needed, by Sellars’ approach, is not an engagement of whether colorless entities could explain our rich family of color-predicates and perceptual judgments, but rather a diagnosis of how one might come to think this explanation is viable. That is, if one thinks
of sense impressions as particulars newly introduced, one might be tempted to ascribe to them only primary qualities. And once this move has been made it becomes a real task to convince one that those new particulars need to have color or similar qualities. Alternatively, we need recognize the error of the initial move. Sense impressions are not newly introduced particulars. Rather, concepts of sense impressions provide for new ways of thinking about color.

The theory of sense impressions does not introduce, for example, cubical volumes of pink. It reinterprets the categorial status of the cubical volume of pink of which we are perceptually aware...The pinkness of a pink sensation is 'analogous' to the pinkness of a manifest pink ice cube...by being the same 'content' in a different categorial 'form'.

Thus Jones' theory (the mythical being of “Empiricism and the Philosophy of Mind” who introduces sense impressions to account for veridical and non-veridical experience) is not ampliative- it does not introduce new particulars, but simply reinterprets our concepts, in this case of color. That said, the path which led to Colorless Scientific Realism is not an option.

Instead, in recognizing that sense impressions are just a new categorial form for the color of physical objects, we realize that sense impressions have to be colored (in some sense): that is where the color of physical objects ends up in the manifest image once we have philosophically scrutinized that image. And any subsequent attempts to identify states of persons with states of aggregates of more basic particulars will have to reckon with the existence of these states of perceivers. The road to Colorless Realism may in the end be a viable one, but it is a more difficult one once we recognize that sense impressions are not particulars, and a fortiori, not colorless ones. Again, color has been transposed from objects to states-of-perceivers, and it is this 'nature' of color which must be reckoned with in any subsequently hypothesized identification with the scientific image's ontology.

At this point, of course, I have only shown the importance Sellars places on the view that there are color-sense impressions of perceivers and that they are not particulars. I have shown the dialectic position of this view but haven't yet motivated it. What then is wrong with Colorless Scientific Realism? Why can we not identify 'color states of perceivers' with determinate states of aggregates of colorless particulars?

III. The Strict Principle of Reducibility

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20 Sellars, CLIII, §44-7.
The preceding sections sought elucidation of the notion of a color-state of a perceiver, and of the
dialectical importance in a Sellarsian philosophy of sensation. As noted, I have yet to motivate the
plausibility of the claim that there is something ontologically special about these states; something
so special that bars their identification with states of aggregates of achromatic particles. In what
follows I survey Sellars’ official line on why these states cannot be so identified, point out how this
position is not satisfactory, and briefly lay the groundwork for my positive (but still Sellarsian)
account that will be developed more fully in the next section.

Recall the categorial transposition of color. Color’s initial categorial location in the
manifest image is that of quality of object. Under pressure from the observation that perceivers
make judgments about colored objects when there are none present, color is transposed into a state
of perceivers. Envisioned identifications with the ontology of the scientific image must deal with
color so conceived.

The most famous Sellarsian reasons lurking behind the claim that such states cannot be
identified with determinate states of aggregates of achromatic particles in the scientific image is the
‘strict principle of reducibility’. As we shall see, however, this principle is insufficient on its own:
support (and indeed grounding) must come from two separate principles that I will introduce— the
‘sense-datum inference’ (SD), and the argument from ‘logical isomorphism’ (LI). Via the use of
SD and LI we can find another, and more tenable, path to Sellars’ sought conclusion that an
adequate scientific ontology must find a place for color as something real and occurrent.

The strict principle of reducibility may be introduced this way: “How, we would surely
expostulate, can an object’s having occurrent pinkness consist in facts about its parts, none of
which facts involves occurrent color?!?”21 Put more directly, the strict principle of reducibility
applies to colors (and the other proper sensibles) and maintains that all the parts of a colored whole
must themselves be colored. Being colored differs, and therein lies the strictness of the principle,
from such properties as ‘being a ladder’ in that one cannot truly predicate ‘is a ladder’ of the parts
which comprise a ladder.22

Because so much of Sellars’ positive ontological position turns on this fact about colors, it
is necessary to locate some principled distinction between ‘being colored’ and other properties.

21 Sellars’ CLIII, §25.
22 Here is the dialectical place of the pink ice cube.
Before attempting to locate or ground the principle, we first, however, need a richer understanding of it and the surrounding terrain.

Contrary to initial appearances, and to the formulation I presented at the start of the paper, the problem we confront is not the straightforward question of whether we can identify sense impressions (states of perceivers) of the manifest image with the scientific image’s ontology. The genuine Sellarsian question is whether we can identify the successor of sense impressions of the manifest image (i.e. sense impressions of the scientific image) with determinate states of aggregates of achromatic particles of the scientific image. Let me spell this out.

The scientific image is to tell us how things are, to give us the final truths about reality. And while the manifest image purports as well to tell us how things are, in the end the scientific image’s account takes precedence. At bottom, the manifest image is merely an account of how things seem. In other words, the manifest image’s account is, strictly speaking, false. But the concepts and truths of the scientific image do not appear ex nihilo, they are methodologically dependent upon the concepts and truths of the manifest image. As well, the explanatory goals of the scientific image include explaining why things in the manifest image appear the way they do, and why we ever took such appearances to be real. When we examine the philosophically refined manifest image, it is those concepts and items of that image which must be explained by the scientific image. And since our philosophical account of the manifest image tells us that colors are really states of perceivers, this must be accounted for by the scientific image. This requires the notion of a successor concept in the scientific image of sense impressions of the manifest image. In other words, what are sense impressions of the manifest image really?- Well, let us locate within the scientific image a concept akin to sense impressions of the manifest image, and then provide a scientific account of that successor concept. Doing so will then tell us what sense impressions of the manifest image really are and why we may have taken them to be something else.23

Having then located within the scientific image a counterpart, a successor of the notion of ‘a sense-impression of the manifest image’, we face the question of whether such an item can be identified with a state of aggregates of achromatic particles. With the strict principle of reducibility in place, it cannot: for according to Sellars, the successor item in the scientific image (that newly

23 I hope this to be a partial spelling out of Sellars’ cryptic statement that “The successor concept of (visual) sensing is to define the ultimate home of the colors of the manifest image.” “‘Science, Sense Impressions and Sensa’”, p.409. See as well SM, chapter 5, §42-53, §66-78 for more on successor concepts.
conceived sense-impression) is a (homogeneously) colored state, just as the manifest image sense-impression was. As such it cannot be identified with a state of aggregates of achromatic particles.

To understand the above it is crucial to note that the strict principle applies within frameworks, not across them. When this is realized the principle gains initial plausibility: Within the manifest image, what could a color, a simple within that image, be reduced to? Since sense impressions of the manifest image inherit the salient formal features of color in the categorial transposition, most notably their homogeneity, it again appears legitimate to say that they cannot be reduced to non-colored sensing states. Now if we were to apply this principle again to sense impressions within the scientific image, it would follow that if sense impressions (sensings) of the scientific image have parts, their parts must be sensings. And since these sensings (and their parts) are colors, there would be color within the scientific image. What’s more, this color would be closely akin to the color of the manifest image by preserving the salient features of occurrent color. In that sense there would be color in the scientific image, a sense much richer than any ‘color eliminativist’ would ever allow. Color would figure as a non-negligible feature of the scientific image.

Now given the strict principle of reducibility’s intra-framework range, the crucial question remains as to whether we need to find a successor item of sense impressions of the manifest image which preserves this color (and homogeneity) across the different images. Once or if we do, given the strict principle, Sellars is pretty much home. For once we’ve got a color-state in the scientific image, the strict principle prevents its reduction to uncolored parts.

But, and this is the key question, why can’t we drop color-sense impressions altogether as we move to the scientific image? Put differently, why can’t the successor concept of sense impressions be so loosely connected with color-sense impressions of the manifest image that we can reduce them away, removing any mention of occurrent color at all? An answer to these all

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24 It inherits the homogeneity of the former, says Sellars simply in virtue of being the successor concept of it. See, for instance, “Science, Sense Impressions and Sensa”, p.408. Of course, why this feature needs to be preserved lies at the heart of the matter and causes all the problems. Again, the present project aims to improve matters by ultimately leaving behind such notions as homogeneity.

25 That this is the way Sellars intends the principle and its connection with successor concepts is clear from his discussion in “Science, Sense Impressions and Sensa”, p.411-5. Later in the paper we find Sellars noting Cornman’s failure to distinguish “the trans-framework sense of ‘reduction’ rooted in the philosophy of science...and the intra-framework sense of reduction, which is rooted not in the philosophy of science, but in abstract considerations of logic and ontology, and which is involved in my ‘Principle of Reducibility’...”, p.443.
important questions is not provided by appeal to the strict principle of reducibility. And unfortunately Sellars gives us little help elsewhere on this all important question. Neither does he anywhere offer a defense of the principle itself. Some of his critics fall short in similar ways.

For example, while offering a cogent reconstruction of Sellars’ arguments, Johanna Seibt chooses to “not discuss whether the argument is sound, in the sense that its premises must inevitably be assumed for philosophical reasons”. Unfortunately, as her reconstruction makes use of the strict principle of reducibility (and thus the notion of homogeneity) we have yet to hear a defense of that essential principle.

William Lycan, on the other hand, notes that “We have to find something in the Scientific Image that actually plays the role marked in the Manifest Image by the term “brown sense-impression”, and this something must be a state of a swarming aggregate, since such an aggregate will be the Scientific-Image counterpart of a Manifest person.” Lycan is surely right that this is the Sellarsian story, but as exegesis of Sellars, we still have not been told why we need to find something in the scientific image that plays the role marked in the manifest Image by ‘brown sense-impression’. For even if we were to find a defense of the strict principle, and thus be able to use it within the scientific image as Sellars envisions, we still don’t have a way to get color across the images. Why can’t we just declare color mere appearance and move on from there?

Herein lies a crucial juncture. We may continue to plug away at the notion of homogeneity as many have done, in an attempt to figure out why we need color in the scientific image. Or, we may drop such considerations of homogeneity entirely. Seibt suggests that Sellars’ arguments in this arena are strengthened if we downplay the role of homogeneity, arguing that Sellars should be understood as arguing that we need to preserve the actuality of the manifest image’s proper sensibles. That is, we need to preserve colors, conceived as real, within the manifest image.

I agree that the homogeneity aspect is far less important than the colored aspect. In fact, unlike Seibt, I shall excise discussions of homogeneity completely. Doing so I believe will help us achieve a deeper understanding of what is driving Sellars’ views, as well as making them more

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27 Lycan, Consciousness, p.95.
plausible. In an important sense then we are leaving the letter of Sellars behind, though certainly not the spirit.

Having now declared my intention of proceeding without ‘ultimate homogeneity’ we need to chart a new course. The goal is to determine why we must find a place for color within the scientific image. Why can’t we just hold that color of the manifest image is mere appearance? This question becomes particularly acute when we recall that from the vantage point of the scientific image, the manifest image tells us how things appear, so why could not color be merely appearance?

There is, I believe, a Sellarsian sentiment lurking in the background of our earlier discussions which can pave the way for a new, deeper understanding.

But when the chips are down there would remain the following argument: We have pulled perceptible qualities out of the physical environment and put them into sensations. If we now say that all there really is to sensation is a complex of interaction of cerebral particles, then we have taken them out of our world picture altogether. We will have made it unintelligible how things could even appear to be colored.29

Sellars is arguing that even if we take the option canvassed several paragraphs before, of concluding that color (and the other proper sensibles) are merely appearance, the explanatory adequacy required of an acceptable scientific image requires a story of how there could even be such appearances. That is, the scientific image must not only tell us how things are, but how it could be that they seemed otherwise; how we ever took the manifest image to be a true story of reality. Without the positing of color somewhere it seems we would be at a loss to explain how there could even be appearances of color. Color-eliminativists have to explain how there could be appearances of color, but to do so without introducing occurrent color into the story at all leaves it quite questionable whether this fact (a fact about appearances) has been explained. It is to provide such an explanation that we need to locate a ‘color’ successor concept of sense impressions within the scientific image.

Color differs, goes the argument, from other phenomena we can explain away as mere

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28 Another reason to drop ‘arguments from homogeneity’ is that no one seems to have been convinced by them. The problems with the homogeneity formulation are numerous. They include Dennett’s explicit claim to not even understand what ‘ultimate homogeneity’ is and his difficulty with the notion of occurrent qualities (“Wondering Where the Yellow Went”). Even for those more sympathetic to Sellars’ program there are difficulties making sense of what a homogeneous color-state is. Clark, (“The Particulate Instantiation of Homogeneous Pink”), however, while granting the existence of such states believes they can be accommodated by a particulate ontology, thereby ruling out the need for a revisionary metaphysic.

29 Sellars, PSIM, p.30.
appearance. For instance, within the manifest image we might cite such phenomena as magic, and by parity of reasoning attempt to conclude that within the scientific image there really is such a phenomena. But of course we needn’t do that because we can explain why there appears to be such a thing as magic without recourse to something really magical. Color, on the other hand, as we shall see, resists such explaining away. It will be argued that any explanation or analysis of experiences of color that does not speak of occurrent color is insufficient.

Putting the matter this way allows us to touch base with another strand in Sellars’ thinking. For the principle behind the above considerations amounts in essence to a version of the well-worn sense-datum inference (‘SD’): something can appear colored only if there is in reality (somehow, somewhere) something colored. On our story, there could have appeared to be colored objects only if somewhere in the scientific image’s ontology there really is color. However, this reliance on SD differs from other philosophers’ usages. For one, within the manifest image, that Jones has a sensation of a pink triangle does not entail the existence of a pink triangular particular (a sensum), for as we’ve seen, within the manifest image, sense impressions are not particulars.10

The Sellarsian theory I’m advancing is, therefore, not a sense-data theory, in spite of the connection and reliance on SD. Additionally, from an epistemological perspective, the actual sensum needed to explain the appearance of color lacks all of the traditional sorts of givenness which earlier epistemologists granted: that which is somehow color is not self-presenting, nor even perceptible by introspection.

To my mind, Sellars’ use of the strict principle of reducibility, and his whole project in general, rests at least on the plausibility of this ‘sense-datum inference’. We need to apply SD in order to secure a successor concept of color-sense impressions of the manifest image within the scientific image- to get color ‘across the images’. Having done that, within the standard Sellarsian framework, the strict principle of reducibility may be applied to those sense impressions. As for us, SD (if plausible) allows us to straightforwardly countenance color as real within the scientific image.

IV. Logical Isomorphism

Having now introduced SD, I want to introduce a principle that ties in with our (and Sellars’

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30 Though within the scientific image, Sellars does believe the inference does go through. Cf.SM, p.172 §59.
implicit) reliance on SD, one which takes us to the heart of Sellars’ philosophy. Let me begin with the following passage which comes in Sellars’ discussion of Kant’s treatment of space. Here Sellars is concerned to address the puzzle that if in fact we are responding to states of ourselves that lack spatial properties, how can it be that we are led to make judgments about spatially related items? In other words, what explains this systematic error in our responses, given that on the Sellarsian account the proximate, immediate stimuli of conceptual representation are states of perceivers?

When, however, it is pointed out that there must be something about the relation between the impressions which makes it that they constitute an impression of [say] adjoining squares, rather than of separated squares, or squares which meet at corners, [one] grants that the relation of the impressions must ‘correspond’ to adjoining in a sense of ‘correspond’ which turns out, from our point of view, to be just the analogy which has already cropped up in our discussion of the qualitative character of impressions. If we represent the genuinely spatial relation of adjoining by ‘R1’, we can represent the ‘corresponding’ relation between the component impressions by ‘R1*’.31

Sellars is maintaining that if we are to explain our conceptual representation of there being two squares adjoined (rather than of being separated) and located in space, we must posit within the realm of sense impressions some analogous structure among those sense impressions which can explain why we conceptually respond to this state of ourselves with that particular judgment and not another. In this case Sellars’ speaks of those impressions standing in the relation of ‘R1*', where that relation is analogous to the spatial relation of adjoining, dubbed ‘R1’.

In the case of color, we can explain why perceivers, who in fact are responding to states of themselves, make judgments about pink cubes, by noting that the states they are in, a state-of-sensing-pinkly, are analogous to the colors of the manifest image. Sellars puts it this way.

Why does the perceiver conceptually represent a red (blue, etc.) rectangular (circular, etc.) object in the presence of an object having these qualities? The answer would seem to require that all the possible ways in which conceptual representations of color and shape can resemble and differ correspond to ways in which their immediate non-conceptual occasions, which must surely be construed as states of the perceiver, can resemble and differ.

Thus, these non-conceptual states must have characteristics which, without being colors, are sufficiently analogous to color enable these states to play this guiding role.32

We can generalize from such theses in order to propose LI, the principle of logical isomorphism. In the above examples of spatial relations and colors we have explained conceptual responses by positing an analogously structured realm of non-conceptual states (sense impressions) which are the proximate stimuli of those responses. In essence, the logical structure

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31 Sellars, SM, p.25.
32 Sellars, SM, p.18.
of the conceptual is mirrored with an analogous structure in the non-conceptual realm. We can represent this thesis of logical isomorphism, in this case, as follows.

![Figure 1]

Here, I* stands for the isomorphism between language and sense impressions, the isomorphism which explains the logical structure of our judgments by recourse to an isomorphic structure in what is the immediate stimulus of our judgings.33

Now it is no accident that I have been speaking of logical isomorphism, nor that such a locution (hopefully) brings Wittgenstein’s *Tractatus* to mind. For the thesis of isomorphism I am chasing is the crucial thread, as I see it, in Sellars’ philosophy, uniting his scientific realism with his

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33 To avoid confusion, I do not intend by ‘the logical structure of our judgments’ a Fregean thesis that there are ontological correlates to predicates and singular terms. Rather, I have in mind the structural relations between concepts, relations that are captured by certain patterns of reasoning and inference. Just what sorts of relations I have in mind will become clearer as we move to a specific version of LI.
Tractarianism.\textsuperscript{34}

From these observations we can arrive at a full Sellarsian position of logical isomorphism. Sellars agrees with Wittgenstein that there is a level of language at which language represents the world in virtue of an isomorphism between the two.\textsuperscript{35} At the same time Sellars believes that in addition to language (conceptual representations) and the world lies the realm of non-conceptual representations, i.e. sense impressions. It is these impressions which are caused by our encounters with the world, and which serve as the stimuli for our conceptual representations of the world. But if representation of the world requires isomorphism between the world and language, and we need an isomorphism between language and sense impressions, it follows that we will get an isomorphism between the world and sense impressions.

![Diagram](Figure 2)

\textsuperscript{34} At least it seems to me that by acknowledging LI, pieces of Sellars' views fall into place. Now whether I'm right in this interpretative claim is less important than whether we can create a strong Sellarsian position. Textual support for the interpretive claim comes from the following passage. “It is therefore crucial to my thesis to emphasize that sense impressions or raw feels are common sense theoretical constructs introduced to explain the occurrence, not of white rat type discriminative behavior, but rather of perceptual propositional attitudes, and are therefore, \textit{bound up with the explanation of why human language contains families of predicates having the logical properties of words for perceptible qualities and relations}.” “The Identity Approach to the Mind Body Problem”, p.207.

\textsuperscript{35} See Sellars' “Truth and Correspondence” for more on this theme.
The intuition that drives these reflections is that the logical structure of language cannot arise \textit{ex nihilo}, it must be backed by a suitably isomorphic structure in nature. Obviously as it stands, LI is an extremely broad and controversial thesis. A defense of it would require an exploration of the nature of representation, which would take us deeply into the philosophy of language, the philosophy mind, and debates about realism. Insofar as the present project is concerned with \textit{sensible qualities} it would be at best a strategic mistake to attempt to explicate and defend LI as it has been stated. Instead, I intend in the next section to address a version of LI which will connect with our earlier discussions of sense impressions.

V. Color-LI

The thesis I mean to defend may be put as follows:

\begin{quote}
Color-LI: The logical structure of color language cannot be explained without recourse to an isomorphic structure in reality.
\end{quote}

A defense of this obviously requires first an account of the logic of color language. As I see it, the logic of color may be put as the view that colors are internally related to colors, and only to colors. Colors occupy a closed logical space, the members of that space being internally related to each other.

The contrast class for internal relations, of course, is external relations. External relations are the sorts of relations in which the relation plays no role in making the relata the relata that they are. For instance, a glass of water is externally related to the table on which it sits. The external relation it stands in is ‘being on top of’. The relation is external in that it is not part of the nature of essence of either the glass or table to be in that relation. Put otherwise, if the glass and table cease to be so related, neither will undergo a change in their nature. They will not cease to be the things they are.

In contrast we have internal relations. We might in turn think of an internal relation as such that in speaking of any relatum, the relation(s) it partakes in is necessarily implied, and vice versa. Put somewhat differently, x is internally related to w, y, z, etc. in that the latter form part of the nature of x. Were x to not be so related, x would not be the entity it is.

So, to say that colors are internally related to colors means that the nature of a particular color depends on its relations to other colors, other members the color-array. Again, to speak of a
color as the color it is requires reference to its relational place within the color array. What is the nature of the relation between colors? Most abstractly, it is that relation which includes only colors. More helpfully, it is the betweenness relation colors bear to one another. Orange, for instance, is between yellow and red, while green is between blue and yellow.\textsuperscript{36}

Another way to make this point is to start with the simple observation that C# is not a color but a pitch. Without this internal relation account we are forced to take this as a brute fact. But if we grant that colors are characterized by internal relations, then the only way in which C# could be a color would be for it to lie somewhere within the color-array, and thus bear that betweenness relation to colors that all colors bear to each other. C#, of course, is not between colors— it is between C natural and D natural. And if it could not be placed into the color array, be placed between colors, it is simply not a color. In the end then, betweenness relations capture the essence of color.\textsuperscript{37}

Now this position may seem to be plagued by paradox. For on this story, each color has its proper place within the color array because of the particular color it is, while at the same time, it is the particular color it is because of its particular place within the color array. One might counter that a color has the particular relations it does to other colors solely because of its intrinsic nature. So the intrinsic nature is prior to any of its relations and it is that nature we should try to articulate. And it looks, goes the charge, that I haven't done that. It might seem as if I've ignored what is essential to color, the intrinsic nature of color. It might seem that this emphasis on internal relations has left out the essence of color. But that would miss the mark.

This account does appeal to the relations a color has to other colors in order to individuate it. But that does not make the relations conceptually or ontologically prior. For to make sense of the particular relations a color has we have to return to the relatum, the color itself. The color has the particular relations it does because of the color it is. The relatum and the relation are intimately

\textsuperscript{36} Here, the betweenness of colors can be modeled on the spatial-betweenness relations. Of course, there are relations, perhaps even necessary ones that go beyond the color array. It very well may be a necessary truth that colored things are extended. But that does not make shape internally related to color. For it is color patches and regions which are extended, not colors themselves.

\textsuperscript{37} I take it that this is only the start of a characterization of the full complexities of the logic of color. For there are various different color relationships: for starters, that between orange and red, between white and red, between transparent and opaque colors, and between luminous and non-luminous colors. Wittgenstein’s Remarks on Colour provides a nice entry point for some of these. A full discussion of the logic of color would also have to address issues regarding cross-cultural differences in carving up the color spectrum. Harrison’s Form and Content offers an excellent overview and discussion of this and related matters.
and necessarily involved. We are talking about internal relations here, not mere external relations. As such, the relata and the relation both figure as essential elements. Thus we haven't dissolved the intrinsic nature of the relata, the color, away.\footnote{More generally, the idea is that the proper sensibles are individuated by their unique logical structure. For instance, the logical structure of color can be modeled by a double-cone, while sounds can be modeled by a spiral staircase. Each resultant quality-space, as it were, then requires accounting for. It might be objected that on my construal both physical objects and sense impressions have a right to be considered color, given that both seem to exemplify the same logical structure of resemblance relations. But we have already seen that given the larger context it is sense impressions only which have the right to be considered color. For they have emerged as the proper explanation of the phenomena of color, including the appearance of colored objects.}

Having articulated the logical structure of color, we may now return to the relation of Color-LI and LI proper. The difference between LI and Color-LI is simply their breadth. LI is a claim about representation in general; that language represents in virtue of an isomorphism between it and the world. Color-LI is a claim about a portion of language, the language of colors. Color-LI maintains that these formal features must be mirrored in reality as it really is, not just as it is conceived within the manifest image. In the linguistic mode, there must be analogous predicates of the manifest image’s color-predicates within the scientific image which correctly represents reality.

It will prove helpful to contrast Color-LI with SD at this point. Both make claims about what is necessary to explain a certain phenomenon; Color-LI’s \textit{explanandum} is the language of colors, while SD’s is the \textit{appearance} of colors. Yet there is a sense, as we shall see, in which both are accounts of the same phenomenon. Even so, it will be far more helpful to attempt a justification of Color-LI than of SD.

First, of the two \textit{explanandums}, Color-LI’s is clearer. Talk of \textit{appearances} of color is notoriously hard to track for we immediately face problems over the intersubjectivity of color experience: is the red experience we are trying to explain the same experience for me as it is for you? Such questions should tend us towards at least a public \textit{explanandum}, one which is offered by Color-LI. Second, were we to attempt to justify SD we would need to explain the various color-appearances we are presented with. Thus we would need to describe them first before even attempting an explanation- we would need to be clear on what the \textit{explanandum} really is. Yet in doing that we would certainly have to appeal to, and use, the language of colors. And even if we were to attempt to talk about appearances as personal experiences, the language we would use to talk about how it seems to us would have to be based on, and derived from the public language of colors. So in both cases, the \textit{language} of colors must be used after all were we to attempt to justify
Seemingly we ought to just go ahead and appeal to the language of colors in the first place. How can it be that there is such a rich language of color within the manifest image? To begin an answer we need revisit the sense-impression dialectic from above.

In those sections we saw the dialectical importance of sense impressions within a Sellarsian philosophy. We also explored their central features. It is now time to assess the plausibility of the move to sense impressions. I shall argue that sense impressions, as so explicated, prove to be essential and necessary ingredients in a satisfactory account of perceptual experience. Having shown that we need sense impressions it will be further argued that we may not attempt to identify sense impressions with states of aggregates of achromatic particles: the reasons which require such impressions at once prohibit such identifications. In slogan form: ‘Color gets in and stays in’. Instead, we must locate, within the scientific image, sense impression counterparts which preserve the logical space of color. But preserving the logical space of color (or any other of the proper sensibles) requires the introduction of entities suitably qualitied, entities with the requisite occurrent properties which stand in the appropriate internal relations to other members of their ‘quality-space’. Doing that will give us color in the scientific image and discharge our explanatory obligations.

Recall the following passage.

For even in normal cases there is the genuine question, ‘Why does the perceiver conceptually represent a red (blue, etc.) rectangular (circular, etc.) object in the presence of an object having these qualities?’ The answer would seem to require that all the possible ways in which conceptual representations of colour and shape can resemble and differ correspond to ways in which their immediate non-conceptual occasions, which must be construed as states of the perceiver, can resemble and differ.39

This illustrates the importance of introducing a realm of sense impressions isomorphic to the conceptual responses of perceivers. I’ve proposed that to explain why perceivers respond with the judgments they do about objects before them, we must recognize there to be sense impressions which are the immediate non-conceptual occasions of those responses. Such states are qualitied in ways which mirror the logical complexity of a subject’s immediate response statements about external objects.

This account provides as well the Sellarsian solution to the Argument from Illusion; to explain how perceivers can be mistaken in their perceptual judgments even when those experiences present themselves as qualitatively identical to veridical perceptions. Sellars' answer is that in all

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39 Sellars, SM, p.18.
cases what one is most immediately conceptually responding to is in fact states of themselves, states whose intrinsic nature can be equally brought about in standard and non-standard conditions.

To explain perceptual responses we must countenance color-states of perceivers (i.e. sense impressions): we transpose color into a new categorial key. Why? Because it is only with color so conceived that we can run the explanations we want to—explaining perceptual experience in both veridical and non-veridical cases. And by acknowledging at this early stage in the discussion the need for introducing color into the realm of sense impressions for an explanation of conceptual responses, we are in fact endorsing one half of Color-LI; the isomorphism being between conceptual responses and sense impressions. Here is the picture again,

![Figure 1](image)

where I* this time stands for Color-LI. Again, to explain why perceivers make the judgments they do in both veridical and non-veridical cases, we introduce a realm of sense impressions (states of perceivers) which are the immediate stimuli of conceptual responses, their intrinsic nature
characterized by analogy with the colors of objects of the manifest image.

But having so endorsed and relied on Color-LI to this point, and thus granting that occurrent color must be *somehow, somewhere* in order for there to be an adequate explanation of our conceptual responses, we cannot later go back and remove color from the picture. For having recognized in the initial stage of the dialectic that we must include color in adequate explanations of conceptual responses, removing it completely as we try to identify states of perceivers with states of aggregates of achromatic particles of the scientific image would be to contradict what we’ve already deemed necessary for an adequate explanation.

Once again, our earlier moves show a need for Color-LI between language and sense impressions, and given that, ‘color-eliminativists’ betray such principles if they try to pull color out of sensations at a later point. In essence, the initial required endorsement of Color-LI seems to require, as a point of consistency, a later and final endorsement of it as well. Only by maintaining an isomorphism between the logic of our conceptual responses regarding color and some analogous structure in nature can we secure an adequate explanation of the former.

Crucially, the isomorphism exhibited between our conceptual responses and the realm of sense impressions at the early stages of dialectic was one that carried ontological weight. In reconceiving the categorial status of color in the move to sense impressions we were acknowledging the need for entities to answer to the logic of color. What is needed now, again on pain of inconsistency, is the same ontologically significant move- one that preserves the logic of color by countenancing with the scientific image a realm of entities that preserve color space. And because such occurrently qualified entities are not already present in that image, they need to be introduced.

Within the Sellarsian framework we might make this point by rewording a passage from Sellars. In discussion of the sense-datum inference (SD) I noted that Sellars makes use of the following argument (putting it in the mouth of Descartes).

But when the chips are down there would remain the following argument: We have pulled perceptible qualities out of the physical environment and put them into sensations. If we now say that all there really is to sensation is a complex of interaction of cerebral particles, then we have taken them out of our world picture altogether. We will have made it unintelligible how things could even *appear* to be colored.

We might now rewrite this passage, in light of the above, as follows:

But when the chips are down there would remain the following argument: We have pulled perceptible qualities out of the physical environment and put them into sensations. If we now say that all there really is to sensation is a complex of interaction of cerebral particles, then we have taken them out of our world picture.
altogether, leaving them neither in sensations nor in the physical environment. We will then have made it unintelligible why we conceptually respond to the world with our richly structured language of color.

In summary, we need to ‘posit’ sense impressions, ones with color-analogue properties, to explain conceptual representations. Yet once we acknowledge this, no longer can we, when asking about the status of those sense impressions, take their color away. Doing so would be to cut our *explanans* off the explanatory vine which we’ve already granted it needs to survive. The principles which require color initially bar the reduction of sense impressions to states of aggregates of achromatic particles. And *that* is the Sellarsian conclusion we sought to reach; why the current scientific picture of reality is incomplete and in need of serious revision.\(^40\)

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