SCIENCE, SENSE IMPRESSIONS, AND SENSA:
A REPLY TO CORNMAN

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I AM MOST IMPRESSED by the effort and care Professor Cornman has put into his "rational reconstruction" of my views on sense impressions. His attempt is all the more impressive, since it involves a collating of passages from essays written at different times and dealing with a wide variety of problems; for nowhere does he find in one place a sustained argument for the thesis he believes me to hold. His method is to "save the appearances" by constructing hypothetical arguments such that if I had developed them, I would have arrived at the views he takes these passages to express. The complex and sophisticated arguments he constructs are often of great intrinsic interest. They invariably illuminate the philosophical issues involved, even when, as I see it, they fail to capture the structure of my thought. But while Cornman's patient and non-polemical search for the reasoning which underlies what he takes to be my views on sense impressions is just the kind of attention a philosopher dreams of getting, I must confess that the fact that he finds the enterprise so difficult is more than a little disconcerting.

How am I to account for this difficulty? I would like to be able to say that Cornman has simply misconstrued the appearances he is seeking to save, and that his subtle hypothetical-deductive theorizing rests on faulty "observation." Yet although I do think that he has misconstrued the views he is seeking to explain, and shall argue this in detail, I have come to see that I must bear a substantial part of the responsibility. He may have missed some clues that were in front of his eyes, but often the passages with which he had to cope were unclear and indistinct. Relatively small errors of interpretation at the beginning of a commentary can snowball into major misunderstandings. This tendency is present in Cornman's essay; but his grasp of the general trend of my thinking has provided a constant corrective, and kept his
hypotheses as close as they are to the truth. And, indeed, if I am disturbed at the difficulty he has found in reconstructing his thought, I derive some measure of encouragement from the fact that in the closing stages of his argument he is so close to formulating the position I have sought to defend, that had he been able to put his apparatus aside and take a fresh look at the evidence, he must have seen that some, at least, of the questions he pursues did not arise.

I

Cornman's central concern is with my view that there is good reason to postulate the existence of "sensa," that is, of particulars which are much the same as the "sense data" of classical sense-datum theory, but which lack the epistemic given-ness (datumhood) of the latter, and are rather to be conceived of as entities demanded by a combination of scientific and ontological considerations which are still largely on the drawing board. Sensa would be elements in an (envisaged) unified theoretical framework (the Scientific Image), and would play an indispensable role in its account of perceptual consciousness. The explanatory role in the Scientific Image of neuro-physiological states of which sensa are constituents would be the conceptual heir of the explanatory role in the Manifest Image, and would play an indispensable role in its account of perceptual consciousness. The explanatory role in the Scientific Image of neuro-physiological states of which sensa are constituents would be the conceptual heir of the explanatory role in the Manifest Image, and would play an indispensable role in its account of perceptual consciousness.

Each of these alternatives is, in an important sense, "emergentist." My choice of the second alternative is motivated, in part, by my acceptance of a "principle of reducibility" according to which attributes of wholes are reducible to attributes of and relations between their parts. A defense of this principle would take one to the very heart of the philosophy of logic, relating, as it does, the functional calculus to the calculus of individuals. I have as yet published no such defense, but have simply stated that I find the principle in accordance with my logical intuitions.

1 This is not to say that animals do not have sense impressions to remind the reader that concepts pertaining to animals are, for the part, pending the successful construction of concepts pertaining to animals. A physical object is one that is defined in terms of physical characteristics.

2 The attributes of wholes to which this version of the principle applies do not include attributes which relate them to other things (i.e., things other than their own parts). To cover these attributes, a more complex formulation must be given which requires an explicit use of the calculus of individuals.
My choice of the second of the above alternatives is also motivated by my conviction that an account of visual sense impressions must do justice to shape as well as color. Thus, granted that a sense impression of a red triangle is, in the Manifest Image, a person sensing in the a-red-triangle manner, I find it difficult to believe that the ultimate mode of being, i.e., the mode of being in the Scientific Image, of the red triangles we sense is that of a manner of sensing. It is for this reason that I recently wrote, in a passage quoted by Cornman,

... If scientific realism is correct, at the end of the road somehow the phrase

a red rectangle

will lose its adverbial status, and will become once again a common noun for particulars, though not the particulars with which the story began.5

What are "the particulars with which the story began?" They are the physical objects of the Manifest Image. Essential to my argument was the claim that it is a categorial feature of these objects that they have color in the same "literal" sense in which they have shape. That is to say, an essential premiss of my argument is a rejection, as an analysis of the common sense framework, of the Lockean distinction between primary and secondary qualities. In the Manifest Image, color is not identical with, though it is conceptually tied to, causal properties pertaining to the perceptual states of normal observers in standard conditions.

The distinction, in its Lockean form, between primary and secondary qualities is a piece of "revisionary" metaphysics—an early, and clumsy attempt to grasp the transpositions into new categories which the perceptible qualities of the Manifest Image must undergo, under the ever more profound impact of theoretical science,6 before they take their final form in the Scientific Image. Cornman's, to me surprising, failure to note the "naively realistic" character, as he would call it,7 of my analysis of the place of color in the Manifest Image, accounts for many of his difficulties in understanding my position, and distorts his conception of his task in a way which has serious repercussions throughout his paper. But then, as we shall see, he consistently underestimates the role in my philosophy of the contrast between inter-framework and intra-framework relationships, and, in particular, of the concept of the replaceability of one framework by another, a special (if global) case of which would be the replaceability of the "Manifest" by the "Scientific" Image of Man-in-the-World.

II

Cornman recognizes that my philosophical outlook involves "many inter-related theses" and hence that a "critique of some [one] central thesis" must take into account "the replies that can be anticipated, based upon other of [his] claims" (Ibid., p. 417). The "central thesis" he is about to examine concerns the status of sense impressions, and in the course of his "attempt to raise objections to the thesis" he anticipates replies which are based not only on my "scientific realism," but also on certain other views.

5 Science and Metaphysics (London, 1967), p. 169. Throughout this article I shall use the following abbreviations for books and articles of mine to which Cornman refers:


which, for the moment, can be lumped together under the heading "logical atomism"—thus my acceptance of a strong principle of reducibility concerning the attributes of wholes, and my "Tractarian" approach to ontology. He acknowledges that the dialectical interplay of these two themes is very complicated, and seeks to do it justice by a method of successive approximations in which they take turns at the center of the stage.

The first theme, in order of appearance, is scientific realism. Cornman begins by distinguishing (pp. 418 ff.) three varieties of scientific realism, which he calls, respectively, "minimal," "moderate," and "extreme." Minimal scientific realism rejects instrumentalism with respect to the entities and properties which are introduced by scientific theories "to explain the observable behavior of physical objects and persons," holding that the corresponding theoretical expressions have genuine reference to "(often unobservable) objects and properties." Moderate scientific realism makes the stronger claim, limited to physical objects (as contrasted with persons), that these "have as constituents and properties only [ital. mine: WS] the objects and properties referred to by certain of the pure theoretical scientific terms that are required for the best scientific explanation of the observable behavior of the objects." Extreme is the form which extends this same strong claim to persons.

Where does he locate me in this spectrum? In view of the fact that he quotes my *Scientia mensura*, i.e., my claim that...

... in the dimension of describing and explaining the world, science is the measure of all things, of what is, that it is, and of what is not that it is not. (*SPR*, p. 173)

one might expect him to have no hesitation in classifying me as an extreme scientific realist. Surprisingly, he considers this possibility, only to reject it. Thus, he writes:

... On the basis of the preceding quotation it would seem that he should be classified as what I have called an extreme scientific realist. This would be mistaken. He agrees with the moderate position, but not the extreme position, because of his views about persons. (p. 419).

Now Cornman is just wrong about this. His mistake, however, is a subtle one (for it obviously takes a sophisticated argu-
several of the very papers which he takes ashis texts, and which he has obviously read with care and understanding, "propositional attitudes" and "conceptual representations," as non-Rylean inner episodes (mental acts) are themselves elements in a "theory" designed to explain human behavior. Thus, in spite of the above, there is a sense in which the primary explanandum in the case of persons is for me, as for Quine, overt behavior.

How then do we differ? Certainly not by Quine's claiming that the relevant explanatory concepts are explicitly definable in terms of overt behavior, for the "bodily states" to which he refers require for their definition the resources of neurophysiological theory. We differ, rather, in that I take seriously, as he does not, the claims of an intermediate stage of explanation; intermediate, that is, between explanation in terms of behavior and propensities to behave, and explanation in terms of neurophysiology and central states. This intermediate explanatory framework is, roughly (but only roughly), that of thoughts and sense impressions (not to mention feelings, tickles, and itches, as construed in classical theories of mind. That "in the "last analysis" I am prepared to argue the identity of the inner episodes postulated by these theories with neurophysiological processes may seem to imply that, after a detour for the purpose of indulging antiquarian interests, I return to the main road and arrive at extreme scientific realism to find Quine waiting. But "neurophysiology" contains many promissory notes (what science does not!) and these are not just matters of detail. Everything hinges on the terms in which they are drawn. It is surely obvious that an appeal to a theory-sketch of human behavior which makes essential use of such place holders as "central state" and "bodily process," without exploring the conditions which an adequate explanatory framework for behavior must satisfy, is to provide purely verbal solutions to serious puzzles in the philosophy of mind and, in particular, puzzles concerning the nature and status of sensory consciousness.

In short, "what I find objectionable in the views of many of my tough-minded colleagues is not their "extreme scientific realism," but rather their failure to pay serious attention to the problem of specifying the conditions which an adequate scientific account of human behavior must meet. This problem calls for just that careful examination of what we already know about human behavior in terms of existing categories, for which, with few exceptions, they have no patience. This failure leads to a reliance on overly simple and inadequate paradigms of what will count as a "scientific object" or "bodily state" or "neurophysiological process" in this anticipated scientific account. To be sure, what we don't yet know, we don't yet know, and the deliberate use of crude models (e.g., "stimulation of C-fibres") may be salutary in that it reminds us of our ignorance. But if this use of crude models and paradigms is not accompanied by a commentary which does justice to what we do know, the end result will be, as it often has been, a crude reductionism which aids and abets the Cartesian reaction.

I wrote above that "... the primary explanandum for me, as for Quine, is overt behavior." Let me spell this out a bit more in terms of general philosophical strategy, for this will enable me, I believe, to explain why Cornman singles out perceptual propositional attitudes in his account of the difference between my scientific realism and extreme scientific realism. In "Empiricism and the Philosophy of Mind," I offered a rational reconstruction of the connection between covert mental episodes and overt behavior, in which this connection is compared to that between the unobservable processes of micro-physical theory and the observable phenomena which the theory is designed to explain. Mental episodes, that is, were construed as elements in a "theory" of distinctively human behavior. In this "theory," the conceptual mental episodes which play the traditional explanatory role of

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8 This verbal magic is beautifully illustrated by the passage, quoted by Cornman in an earlier draft of his paper, in which Quine argues that "... if a certain organization of theory is achieved by thus postulating distinctive mental states and events behind physical behavior, surely as much organization could be achieved by postulating certain correlative physiological states and events instead . . . the bodily states exist anyway; why add the others?" (Word and Object, New York, 1960), p. 264.

9 Minnesota Studies in the Philosophy of Science, Vol. I, (Minneapolis, MI) edited by Herbert Feigl and Michael Scriven, reprinted as chapter 5 in SPR.
"thoughts" are taken to have a strong positive analogy (it should not be necessary to dwell on the negative analogy) with the candid verbal behavior to which, according to the "theory," they give rise when our ability to "think-out-loud" is not, as it usually is, inhibited. According to this reconstruction, then, concepts pertaining to thinking-out-loud (and to propensities to think-out-loud) are prior to concepts pertaining to thoughts as (non-verbal) inner episodes, in the sense in which concepts pertaining to the macro-physical objects of the Manifest Image are prior to the concepts of micro-physical theory.

Now it is part of this general picture that perceptual thinking-out-loud, i.e., candid vocal behavior in perceptual contexts, be the primary explicandum in a philosophical analysis of concepts pertaining to perception. And if there is a genuine need to postulate sense impressions to account, among other things, for such facts as that it can seem to Jones that he is in the presence of a red and rectangular object, when none is in fact there, this need must also make itself felt at the level at which (according to the strategy) we attempt to understand in "behavioristic" terms how Jones can be moved, in these circumstances, to say "Lo! Here's a red and rectangular object." In other words, if there is a need to postulate sense impressions as part of a general theory of perceptual prepositional attitudes, in which the propositional component is construed in terms of non-verbal inner episodes, there is a fortiori, according to this philosophical perspective, a need to postulate sense impressions as part of a general theory of perceptual propositional attitudes in which the propositional component is construed in terms of overt verbal behavior and propensities to behave (cf., SM, chapter III, section 36; SPR, p. 90). I have failed to stress this point, however, with the result that I could be taken to imply that the need for sense impressions makes itself felt only after the framework of thoughts as non-verbal inner episodes has been "introduced." This failure justifies Cornman's conviction, mistaken though it is, that I regard sense impressions as necessary elements in a theory adequate to explain not just "human behavior," but also "perceptual propositional attitudes."

Thus Cornman's contrast between extreme and Sellarsian scientific realism in terms of their explicanda is a blind alley, and his question should rather he, how does Sellars differ from other extreme scientific realists with respect to the sort of entities and attributes scientific theory will need to postulate to give an adequate account of persons. This question rises to the surface on p. 420 and dominates the remainder of his paper. Thus, immediately after his definition of Sellarsian scientific realism he writes:

Sellars disagrees with . . . Quine's implication that "Correlative physical states" [correlative, that is, with overt behavior: WS.] will be able to take over the explanatory role of all mental entities. More specifically, he claims that they will not be able to take over the role of certain theoretical "inner" particulars, sensa, in the scientific explanation of propositional attitudes. (p. 420)

Cornman has previously characterized these "correlative physical states" by relating them to "the terms of neurophysiology and other physical sciences" (p. 420), thus he is now focussing attention on the question whether or not it is thought that an adequate scientific account of persons will involve entities and attributes which fall outside the scope of "neurophysiology and the other physical sciences." Cornman takes it that my answer is "yes," whereas extreme scientific realists (e.g., Quine) would say "no," In other words, Cornman attributes to me the view that neurophysiology (a "physical science") will not be led to postulate the sensa which I conceive to be needed in "the scientific explanation of propositional attitudes." Thus he writes

[Sellars] . . . disagrees with identity theorists such as Feigl and Smart because he claims that there are sensa and none are identical with brain entities, (p. 421)

Cornman offers no evidence for this claim, and it is, indeed, false. As I have pointed out elsewhere, if one uses the term "physical" as a category word for basic objects and attributes which are necessary to and sufficient for the scientific description and explanation of the behavior of non-living matter, or which are definable in terms of such items and attributes, then sense impressions and their counterparts in an ideal neurophysiology would not be "physical." If, on the other hand, one makes a more
permissive use of this term in which it also includes the entities and attributes required for the scientific description and explanation of the behavior of living organisms (provided only that these entities and attributes do not have the irreducible intentionality which would require them to be classified as mental rather than physical, if the category of the physical is not to be trivialized), then the way is open for holding, as I do, that sense impressions and their counterparts in an ideal neurophysiology are physical. In the terminology which I introduced some fifteen years ago, sense impressions (and sensa) are not "physical," though they are "physical," Cornman makes a left-handed acknowledgement of this fact by writing, in a footnote to the passage quoted above, "

Strictly speaking, Sellars would reject this identity claim only if the relevant brain entities are what he calls physical entities. He claims that there is a sense in which sensa are brain entities (IA, sec. 28-32), and a sense in which they are physical, i.e. physical (p. 423, n. 7)

Indeed! Unfortunately this subterranean acknowledgement has no reverberations in the main text, where it is assumed throughout that my sensa are not "brain entities" and are not "physical." Thus he continues to use the term "physical" in a way which ignores the increasing tension between different criteria, substantive and methodological, for its application. Are chemical entities and attributes "physical"? Are micro-biological entities and attributes physical? Are neurophysiological entities and attributes physical? . . . The important thing, of course, is not the word, but the distinctions which must be drawn to avoid confusion. This is particularly true in contexts where the putative

That the concept of such irreducible intentionality is a philosophical mistake is a thesis I have long been defending. It is also part and parcel of my views that sense impressions are not intentional states of persons. Sense impression contexts, e.g., "Jones has a sense impression of a red triangle," are, indeed, intentional in the Manifest Image, in that existential generalization, e.g., to "(Ex) x is a red triangle," is invalid. But the intentional character of these contexts in the Manifest Image is accounted for by my theory of sense impressions. It is only when sensa are introduced along with new color and shape predicates, that the counterpart in the Scientific Image of "Jones has a sense impression of a red triangle" becomes extensional, and entails "(Ex) x is a red triangle."

 reducibility" of a theory "belonging to" one "science" (cf., university department), to a theory "belonging to" another 'science' (cf., university department) is in question. One who uses the term "physical" must take into account the time-bound character, of the division of scientific labor.

III

The passages I have been discussing constitute Cornman's introduction to the main argument of this paper. I have commented on these at such length because the considerations I have advanced will enable me to deal in relatively short compass with several of his elaborate attempts to construct supposedly Sellarsian arguments for supposedly Sellarsian views. The central theme of these arguments and views is "Materialism." Thus he tells us that

Already we see that something is wrong, for nowhere have I expressed the opinion that "materialism is mistaken." Cornman is quite right to infer that I would reject what he calls "eliminative" or "reductive" materialism, for it is clear that my sensa are not physical. But the question as to whether I would reject materialism tout court presupposes a decision about how the term "materialism" is to be used. Cornman clearly thinks that a position is materialistic if the only objects it countenances are "physical." I would not object to this criterion if a clear sense were given to the term "physical." Without it, controversies over who is and who is not a materialist may or may not be full of sound and fury, but they certainly signify nothing.

I have, indeed, rejected "reductive" materialism, if by this is meant the view that reality consists, in the final analysis, of physical particulars characterized by physical attributes and relations; and Cornman would be correct in inferring this from my critique of "reductive" forms of the identity theory. Yet if the
sensa which, as I see it, are essential to the ideal scientific image are not physical, they are physical as belonging to the framework in terms of which the states of those physical systems which are sentient organisms are to be described and explained. Whether or not a position which admits particulars which are physical but not physical is properly called (non-reductive) materialism calls for a terminological decision based on a careful analysis of historical usage. And what of a position which, though it admits only physical particulars, claims that certain wholes consisting of physical particulars, thus sentient organisms, have, as wholes, irreducibly non-physical attributes, e.g., sensing-redly? Perhaps the latter has the better claim to be called "non-reductive materialism." But it should be noted that the difference between the two concerns is the ontological status of the irreducibly non-physical items in their world pictures. Can we rest content with "senses-redly" as a primitive predicate of systems of physical particulars? My reasons for answering in the negative will emerge in the course of the argument.

It is clear, then, that when Cornman proceeds to ransack my writings for an argument against "materialism" he is looking for something that not only isn't there, but never pretended to be there. Nevertheless he does find, or thinks he finds, indications of an elaborate argument against something—and whether or not that something should be called "materialism" is less important than the fact that in the course of finding the argument Cornman ascribes to me certain premisses and chains of reasoning which, if on occasion, they misrepresent my views, do so by presenting explicit alternatives which require and assist reply in kind.

Actually, of course, Cornman does not claim to "find" this argument. "... I shall draw material from a variety of Sellars' writings with the hope that the integrated result will help illuminate the relationships between certain of his seemingly isolated theses. Sometimes I shall have to extrapolate and interpolate, because in certain central places I find unclarity in statement and invalidity in argument. By doing this, I hope to pinpoint a crucial place in Sellars' work where he must considerably clarify and strengthen his argument for Sellarsian scientific realism." (p. 421)
sions are particulars. They are, rather, states of perceivers, and their counterparts in the Scientific Image must also be states of persons, now construed as neurophysiological systems. Sensa are ingredients of these neurophysiological states, and it is the sensa, not the sense impressions, which are particulars.

But more of this later, for although his main target is premiss I, Cornman warms up to his task by examining premiss IV. As he sees it, I reject the view that "sense impressions are identical with certain brain phenomena" on the ground that "a red sense impression, for example, has the property of being 'ultimately homogeneous'," a feature which (and here he quotes from SPR, p. 35) "seems to be essentially lacking in the domain of the definable states of nerves and their interactions" (p. 423). He seems to recognize that according to my analysis, the ultimate homogeneity involved in the concept of a red sense impression is grounded in the ultimate homogeneity involved in the concept of a red physical object, but muddies the waters by misinterpreting the force of ultimate homogeneity as it is introduced in the latter, or primary, context. My argument was to the effect that a system of micro-physical particles, none of which is pink in what Cornman elsewhere calls the "naive realist" sense of "pink," cannot, as a whole, be pink in the "naive realist" sense of "pink." My argument explicitly involved a "principle of reducibility" to the effect that every (non-relational) property of a system of objects "consists of properties of, and relations between its constituents" (SPR, p. 27). I argued that the pinkness of a whole does not consist in the parts of the whole having properties other than pink and standing in certain relations to one another, as a whole's being a ladder consists in its parts having properties other than being a ladder (e.g., being a rung) and standing in certain relations to one another." I concluded that the pink ice cube of the Manifest Image, pink in the "naive realist" sense, cannot literally consist of microphysical particles, granted that the latter are not pink in the naive realist sense. I argued, in short, that the ice cube as a system of micro-physical particles is the counterpart in a different conceptual framework (the "Scientific Image") of the pink ice cube of the Manifest Image. The "manifest" ice cube is "identical with" a system of micro-physical particles in the complicated sense that in this successor framework, the ice cube concept would be defined in terms of micro-physical particles, so that ice cubes as thus conceived would be literally identical with systems of microphysical particles. Needless to say, to spell out in adequate detail the semantics and pragmatics of "successor" concepts and "successor" objects is a difficult and demanding task which I have scarcely attempted. 

However this may be, it is clearly something like the above argument for denying the "identity" in a more simple-minded sense of the "manifest" with the "scientific" ice cube which finds expression in the passage to which Cornman refers, and since if hinges on the idea that the physical objects of the Manifest Image are colored in the "naive realist" sense, Cornman clearly misses the point when he objects that

... if each of a group of discrete particles was the same color, then it would certainly seem the macro-entity they constitute would have the property of appearing homogeneously colored to normal perceivers under normal conditions. And this, it is plausible to argue, in one clear meaning of the claim that a physical object is homogeneously colored, (p. 423, italics mine save for last, 'is': WS.)

Thus the initial stage of his discussion of premiss IV is a simple ignoratio.

It should be emphasized that the concept of ultimate homogeneity is closely related to the traditional concept of a simple quality. It differs primarily by relating the latter to the logic of whole and part. Applied to my example it says that the pinkness of a whole (the pink ice cube) does not consist in a relationship of non-pink parts. And, indeed, the stress is not on sameness or


13 In using this example, one tactically makes abstraction from the functional dimension of the concept of a ladder, which involves a reference to human purpose. One might substitute the example of a hydrogen atom, the parts of which are not hydrogen atoms.

14 But see SM, chapter 5, sections 42-63, 66-78.
difference of color, for the point I am making concerns the generic character of being colored. Thus the being colored of colored objects (in the naive realist sense) does not consist in a relationship of non-colored parts. As I put it in the paper on which Cornman is commenting,

An ice cube variegated in color is, though not homogeneous in its specific color, "ultimately homogeneous" in the sense to which I am calling attention, with respect to the generic trait of being colored.

(SPR, p. 26)

Now it should be clear from the above that the principle of reducibility to which I made appeal plays a decisive role in the argument. For without it, I cannot conclude from the "ultimate homogeneity" of color that colored objects do not consist of non-colored constituents (micro-physical particles). Nor could I conclude from the ultimate homogeneity of sense impressions that persons do not consist of particles which severally do not sense.

Although he missed the role of the principle of reducibility in the argument from ultimate homogeneity, he does recognize the importance that I attach to it. He therefore constructs another and "stronger" argument in which it does play a key role. But before examining this argument, it will be helpful to sketch the strategy which, in the paper analyzed by Cornman, connects the ultimate homogeneity of color with the argument for the existence of sensa. The general line of thought is contained in the following paragraphs.

We must find a place in the world for color in the aesthetically interesting sense with its ultimate homogeneity. In the Manifest Image the primary concept of red is of red physical objects. Nevertheless there is a derivative sense of "red" in which red is a manner of sensing. Colors as manners of sensing form a logical space, modelled on colors as attributes of the physical objects of the Manifest Image. They inherit the "ultimate homogeneity" of the latter. Now we must distinguish between primacy in the order of being and primacy in the order of conceiving. The question thus arises, does the derivative concept of red as a manner of sensing capture the true ontological status of red? Can we rest content with the idea that red in the aesthetically interesting sense is a manner of sensing, that, (in traditional terms) its esse is percipi? Is its ontological status given by the context: Person senses-redly?

Now science suggests that persons are systems of scientific objects. But, if we accept the principle of reducibility, for a system of scientific objects to sense-redly must consist in its constituents being in certain states and standing in certain relations to each other. Now sensing-redly as conceived in the Manifest Image does not consist in a relationship of objects in states other than sensings. A sensing can include other sensings, as when we sense a red-circle-in-a-green-square, but it cannot consist of non-sensings.

It is easy to take for granted that the "manifest" concept of sensing can simply be transplanted into the Scientific Image. If we think, instead, of the latter as containing a successor concept of sensing, the way is open for resolving these conceptual puzzles. How is this successor concept to be construed? Sensing will still be a state of a person, but it will reflect the fact that persons in this image are systems of scientific "objects." Thus, taking the principle of reducibility into account, it will be a state which consists in certain states of and relations between these "objects."

Now the successor concept of (visual) sensing is to define the ultimate home of the colors of the Manifest Image. And to do this job, it must relocate the "ultimate homogeneity" of the latter. But it cannot do so if the persons to which this successor concept applies consist of objects to which color concepts, in a sense which preserves the essentials of color space, do not apply. But, unless we introduce Cartesian minds as scientific, objects, individual scientific objects cannot be meaningfully said to sense-redly. Nor can the scientific objects postulated by the theory of inorganic matter be meaningfully said to be, in a relevant sense, colored. What is the alternative—if the principle of reducibility

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15 See my discussion of this topic in SM, pp. (12 ff.
16 It is of the essence to bear in mind that scientific objects need not be particles. Neither the categorial structure nor the factual content of the (ideal) scientific image should be equated with the corresponding features of current micro-physics.
is not to be abandoned? It is, in the first approximation," to introduce a new domain of scientific objects to be the subjects of these successor color predicates.

I have pointed out that if it is to do the job, such a successor concept must involve the "ultimate homogeneity" of color, for it is to be the final home, the ultimate "transposition" of the colors of the Manifest Image. In this final transposition color would exist as colored particulars, which, however, unlike the colored particulars of the Manifest Image, would not be physical objects, i.e., would not have the causal properties characteristic of ice cubes, tables, and chairs. They would exist only in the context of neurophysiological process, and by virtue of this fact would be "physical_1" but not "physical_2."

Thus, at the end as at the beginning of the journey, our image of man-in-the-world would include color with its ultimate homogeneity as an occurrent attribute of actually existing particulars. Indeed, in the Scientific Image, as yet dimly discerned, the successor concept to sensing-a-red-triangle, would be the concept of a neurophysiological state which includes the actual existence of a red triangle—where the concept of a red triangle would be the successor concept to the "manifest" concept of a physical object which is red and triangular on the facing surface.

Cornman begins his discussion of my principle of reducibility by reformulating it to read,

R2 For any object, 0, that is a system of objects, if 0 has a kind of property, \( K \), then \( K \) is a kind of property the individual constituents of 0 have. (p. 425)

He justifies this reformulation by claiming that as I use my principle in the passages about "ultimate homogeneity" it is "equivalent" to R2. Cornman is simply wrong about this, and I strongly object to being saddled, even momentarily, with an absurd principle on such flimsy grounds.

17 "In first approximation" because the philosophical clarification of the categorial structure of the Scientific Image is a fortiori as much a regulative ideal as the Scientific Image itself.

Cornman then offers another formulation, which he admits to lie "closer to Sellars' original statement."

R3 For any object, 0, that is a system of objects, if 0 has a property, \( P \), of kind, \( K \), then either \( K \) is a kind of property the individual constituents of 0 have, or 0 having \( P \) is reducible to some, (at least) of the individual constituents of 0 having some other properties or relations, (p. 425)

Notice that Cornman substitutes "is reducible to" for the "consists of" of my own formulation. This enables him to mobilize the fact that philosophers of science have given a variety of accounts of the "reduction" of one scientific framework to another. My principle, however, concerns the internal structure of conceptual frameworks, and belongs, properly speaking, to logic or general ontology, rather than to the philosophy of science.

Thus, to take the example he uses to test the principle, it concerns not the relation of concepts in one framework (e.g., temperature in the "observation framework" as an operational construct which applies to gases as empirical objects subject to laboratory manipulation), to concepts in another framework (e.g., the basic concepts of kinetic theory), but, rather, concerns each framework separately, and asserts that in each of them a whole's having a property consists in its parts having properties and standing in relations. The principle is, in a familiar sense (which, however, is most difficult to explicate) a regulative one. For, telling us, as it does, that if an object is (as contrasted with is correlated with) a whole of parts, its having \( P \) consists in its parts having properties and standing in relations, it also tells us that if an object has a property which violates the principle, then in that context it is correlated with rather than consists of the "parts."

The trans-framework character of Cornman's R3 comes out clearly in his discussion of the Scientific Image on p. 426, where he writes

... there will be one complete scientific description only when all sciences are unified. This requires that all descriptions true at some scientifically non-basic level, such as chemistry, biology, neurophysiology, and including the observation level, have counterpart descrip-
tions true at the scientifically basic micro-physical level, that is, at the
level of scientifically basic or simple entities.

and continues

It certainly seems that there would be a complete set of such counter-
parts once all objects meet; the reduction requirements of R3. For if '0
has P' is true at some non-basic level, and 0 having P is not only
correlated via correspondence rules with, but also reduced to,
the constituents, C, of 0 having Q, then 'The C of 0 have Q' would be the
basic level counterpart of '0 has P.' " (Italics mine: WS.)

At this point in his argument, Cornman claims that if I accept
R3, "[my] preceding argument that sensa are not identical with
anything physical fails, because R3, unlike R2, is compatible
with something that appears homogeneously as red being reduc-
ible via correspondence rules to some brain phenomenon con-
sisting of certain scientifically basic physical particles having
some quite different property for relation" (p. 426). Now I have
already stressed that physical objects as construed in the
Manifest Image are colored in what Cornman calls the "naive
realist" sense. In this context I used my principle of reducibility
to argue that whatever manifest objects may be correlated with,
they cannot literally consist of micro-physical particles, or be
literally identical with wholes consisting of micro-physical
particles. For, given this principle, a whole consisting of micro-
physical particles can be colored (in the naive realist sense) only
if these particles are themselves colored (in the naive realist
sense) which, as I claimed in a passage quoted by Cornman,
"doesn't make sense." But if I limited myself to Cornman's R3, I
could not conclude from the ultimate homogeneity of (naive)
color to the non-identity of manifest objects (e.g., a pink ice
cube) with wholes consisting'

" From the reference he makes to my TE, reprinted in Philosophical
Perspectives (Springfield, Ill., 1967), and from the argument of the para-
graph which follows this quoted passage, it is clear that the "reduction"
which Cornman is defining involves correspondence rules. In his contrast
between "reduction" and "correlation via correspondence rules," the latter
involves what I there called "methodological" as contrasted with "sub-
stantive" correspondence rules. An example of a methodological
 correspondence rule would be the correlation of temperature with
electromagnetic radiation.

of micro-physical particles. For, in the absence of any "strong"
principle of reducibility, a system of micro-physical particles
could as a whole be (naive) pink, although none of its ultimate
parts was colored in the naive realist sense. Cornman's principle
would require only that the fact that the ice cube is pink be
reducible (via correspondence rules) to the fact that its micro-
physical parts have such and such micro-physical properties and
stand in such and such micro-physical relations.

Similar considerations apply in the case of sense impressions,
although Cornman muddies the waters by giving space to the
absurd idea that for a brain (construed as consisting of scientific
"brain entities") to have sense impressions of color is a mallei' of
"brain entities" having color either in the naive realist sense or in
the sense that they "appear colored to normal observers in
normal conditions" (p. 428). Notice, for future reference, that the
absurdity of these alternatives, which Cornman himself notes,
does not preclude that (certain) "brain entities' (i.e., sensa) might
be colored in still a further sense of the term—which is exactly
the view I am defending.

After this curiously relevant irrelevancy, Cornman makes the
relevant claim that his R3 "would allow the brain science to ex-
plain, at its level, using only the kinds of predicates that apply to
physical particles, what, at another level, would be explained by
assuming sense impressions' (pp. 426-427). The issues that
divide us rise to the surface when he adds "this would allow in
turn for there to be a complete explanation and description of
everything without requiring unique variables ranging over a
different kind of basic entity, sensa." It is clear that by the phrase
"complete . . . description" he means complete description in
terms of the predicates of the "basic science," for the whole
consisting of these particles can also be described at "another
level" as having sense impressions. Thus it is essential to note
that in my conception of the Scientific Image the framework of
the basic science replaces the frameworks of the "other levels. It
will, therefore, contain a successor concept which replaces the
concept of a sense impression which belongs to the Manifest
Image. And my principle of reducibility requires that this suc-
cessor concept in the framework of ideal neurophysiology be a
reducible concept, i.e., that, in this framework, for a
neurophysiological whole to have a sense impression of a pink
cube is for its elements to have such and such attributes and
stand in such and such relations. It is because of this requirement
that I am led to argue that ideal neurophysiology must find a
place for sensa, i.e., items which are the ultimate successors to
the colored and shaped physical objects of the Manifest Image.
Cornman's interpretation of the "reducibility" of one level to
another, on the other hand, would permit a whole consisting of
brain entities to have a sense impression of a pink cube, where
having this impression does not consist in its elements having
such and such properties and standing in such and such relations,
though it is reducible (via correspondence rules) to the latter. In
other words, in the absence of any successor concept or
"redefinability" interpretation of "reduction" such as he sub-
sequently accepts for the sake of argument, Cornman's principle
would permit the character of having a sense impression of a
pink cube to be, in my sense, an irreducible (ie., emergent or
holistic) character of brain entities, which was correlated by a
"bridge law" with purely physical properties and relations of
physical particulars.

Cornman asks "whether Sellars is right in thinking that his
version of the scientific image actually requires a principle as
strong as R1 or R3 . . . even if we grant that the. Sellarsian scien-
tific image is justified only if all macro-objects that exist are
identical with groups of basic particles" (p. 427) ? This way of
putting the question implies that I hold that all macro-objects are
identical with particles, i.e., that their counterparts in the Scientific Image are
definable in terms of attributes and relations necessary and
sufficient to describe items other than sentient organism. The
holistic materialism described above would presumably hold that
sensing a pink cube and feeling a pain are physical, but not
physical states of the person, as a whole made up of particles.

IV

I turn now to Cornman's examination of Premiss I, i.e., the
proposition that "If scientific realism is correct, then sense im-
pressions are particulars." He begins this examination, which
occupies him, by and large through the remainder of his paper,
by emphasizing that "the arguments I present will, once again, be
extrapolations from and interpolations into his writings" (p. 429).
He tells us that he will "claim not only that Sellars' defense of I
is unsatisfactory, but also that I is false." Now I have, I hope,
made it clear that I do not accept the proposition in question as it
stands. For although sensa are particulars, they are not the
successors, in the Scientific Image, of sense impressions. What I
have argued is that the sense impressions of the Scientific Image
are reducible states of wholes consisting of scientific objects
(not particles), and that these wholes have among their constituents
sensa. But this correction, though necessary, does not turn the
edge of Cornman's critique.

Cornman begins by agreeing that "sense impressions, for
example, impressions of a red and triangular object, . . . are used
to explain perceptual propositional attitudes, such as being under
the impression that there is a red and triangular object in front of one" (p. 429). He then argues that "there is no need to also grant that these impressions of must be particulars" (p. 430). To this the answer is that in the framework in which they are introduced the explanatory role of sense impressions not only does not require that they be particulars, but does require that they be states of perceivers. The claim that in the Scientific Image sense impressions involve (not are) a special set of particulars (sensa) springs not from the explanatory role of sense impressions, but from ontological considerations pertaining to the existence of scientific objects and the reducibility of group attributes.

Cornman points out, correctly, that I do not make what Chisholm calls the "sense datum inference," i.e., that I do not analyze "Jones senses a red rectangle" (in the Manifest Image) as asserting a relation between Jones and a red rectangle. He notes that I construe the "objects" of sensing adverbially, so that the depth granimer of the statement in question turns out to be "Jones senses a red-rectangle-ly." But, Cornman continues, "Sellars thinks that the adverbial theory will not do for the scientific image in which persons are bundles of particles" (p. 431). The latter involves a "picture of persons consisting of groups of basic physical particles in some kind of relationship to a quite different kind of basic particulars, sensa, which are the finally derived counterparts in the scientific image of sensibly colored physical particulars in the manifest image ..." (p. 431). The latter involves a "picture of persons consisting of groups of basic physical particles in some kind of relationship to a quite different kind of basic particulars, sensa, which are the finally derived counterparts in the scientific image of sensibly colored physical particulars in the manifest image ..." (p. 431).

I shall not dwell on the caution with which I have spoken of the as yet dimly glimpsed categorial structure of the Scientific Image, nor on my warning against assuming that the particles of current physical theory will continue to be "particles," rather than singularities in a "field," or abstractions from a domain of "pure process." It is a truism that we can expect unexpected twists and turns in the evolution of both field and particle concepts." Again it should not be assumed that the sensa of the Scientific Image will have the categorial structure of the visual sensa of classical sense datum theory. Something like C. D. Broad's characteriza-

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1) For an exploration of this theme see Mary Hesse's excellent Forces and Fields (London, 1961).

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21 Note that the fundamental ontological category which is relevant is that of a concretum (as opposed to an "abstract," or "conceptual" ability). It is not clear that a concretum need have the specific traits connoted by the term "particular" as currently used. A "pure process" would be a concretum. Would it be a "particular"?
In the analogically derivative use, "a red rectangle" expresses a manner, rather than a relation, of sensing. The analogy between the use of color and shape words in sense impression discourse and in physical object discourse is "transcategorial." But in his comment on this view, he raises an objection which reveals a misunderstanding of the role which I attribute to sense impressions. He has previously quoted me correctly (p. 429) as claiming that

sense impressions . . . are common sense theoretical constructs introduced to explain the occurrence ... of perceptual propositional attitudes, and are therefore bound up with the explanations of why human language contains families of predicates having the logical properties of words for perceptual qualities and relations. (I A, sec. 4-9)

He now considers the objection that an

object-state analogy ... is not close enough to help explain the occurrence of impressions that some object is red. That is, bow could the state of red-sensing, which is not sensing an object, explain being under the impressions that there is an object and it is red. Or again, how can a person come to believe that there is an object, if none of perceptual states in which his beliefs arise include any objects at all. (p. 433)

He writes that "as far as I know Sellars has not replied to this objection." But, surely, this passage proceeds from the weak thesis (which is all that I advanced) that sense impressions help explain the occurrence of impressions that some object is red, i.e., that they are elements in a complete explanation, to the stronger thesis that they explain, i.e., are the complete explanation of "being under the impression that there is an object and it is red." And, surely, if I were to reply that the explanation of perceptual propositional attitudes requires, in addition to sense impressions, a reference, among other things, to conceptual abilities, i.e., to the possession by the perceiver of the conceptual framework of physical objects in space and time, Cornman would allow that he was not taking me to deny this. Thus it is clear, on reflection, that Cornman is asking how I can account for the possession by perceivers of the category of physical object, "if none of the perceptual states from which his beliefs arise include any objects at all"? This question obviously raises important, issues concerning the origin of categorial concepts, and, ultimately, concerning their status. Cornman, apparently, subscribes to some form of abstractionist account, construing is an object (i.e., as a substance) as a basic first level concept which we would not have unless we had been presented with at least one object (i.e., substance). Assuming that I am a kindred spirit, he seeks to rescue me by pointing out that in "Philosophy and Scientific Image of Man" (SPR, chap. 1) I claim that "in the construct which I have called the 'original' image of man-in-the-work all 'objects' are persons, and all kinds of objects ways of being persons" (pp. 9-10). Thus, he seems to suggest, I would account for our possession of the category of object (substance) in terms of our being presented with ourselves, thus acquiring the concept of a person, from which concept, by a pruning of differentia, the more general concept of an object would arise which, combined with such concepts as that of shape, would generate the concept of a physical object.

But, in the first place, abstractionism would require that to have the concept of shape, I be "presented with" shapes, not with sense impressions of shapes, adverbially construed. In the—second place, my conception of the categories is Kantian in that is an object is a second level concept, i.e., a concept which is predicated of conceptual items. In the third place, if "S is presented with x" is to stand for epistemic facts, it presupposes rather than accounts for the possession of concepts. And, last but not least, if our account of concept formation is to be causal, rather than abstractionist, then the thesis that the total explanation of the existence in the human community of concepts of perceptible qualities must postulate items (sense impressions, ultimately sensa) having characteristics analogous to these qualities, is compatible with the idea that the conceptual framework of the Manifest Image is less adequate than one which might be developed in the course of scientific investigation.

I have gone into this point in some detail, because if one takes an abstractionist approach to the category of substance, one will be tempted to argue that the manifest concept of a person, which is not the concept of a whole of parts, involves the
givenness of a substance which is not a whole of parts, i.e., a simple substance." It would follow that scientific realism would have to be held in a form compatible with a Cartesian account of persons. And, indeed, Cornman seems to be, in his own terms, a "moderate" scientific realist.

This brings me to the second argument for "Premiss I" which Cornman extrapolates from and interpolates into my writings. This time he is actually able to quote an argument for introducing "a new category or entity ('phantasms' or 'sensa' we might call them) with predicates the logical space of which is modelled on that of visual impressions, as the latter was modelled on that of colored and shaped physical objects." 23 Cornman sums up the argument as follows

... the adverbial interpretation of sense impressions requires persons to be single logical subjects, and while this is compatible with the manifest image, scientific realism and the scientific image require them to be pluralities of logical subjects. Thus, although in the manifest image sense impressions can be states of perceivers, they must be some kind of inner particular in the scientific image. (p. 434)

Before I turn to examine Coalman's attempt to bring out the tacit premisses of this enthymene, I must admit that my initial formulation of the conclusion of the argument he quotes does, in its context, have the unintended implication that the counterparts in the Scientific Image of sense impressions are sensa. Thus, in evaluating the impact of scientific realism on the status of sense impressions, I wrote "We must therefore either introduce another logical subject (an immaterial substance) to do this work [i.e., to serve as subjects of verb 'to sense red-rectangle-wise'], or turn each sensing into a logical subject in its own right, i.e., introduce a new category of entity . . . sensa ..." I clearly should not have written "... turn each sensing into a logical subject in its own right," which suggests, in the context, that these new "log-

23 See my discussion of Kant's analysis of the "paralogisms" of "rational psychology" in the concluding section of "Metaphysics and the Concept of a Person," Karel Lambert (ed.): The Logical Way of Doing Things (New Haven, 1969).

logical subjects, whereas in the Scientific Image persons are single logical subjects only in the sense in which a whole (in the broadest sense) consisting of parts is a single logical subject, i.e., are single logical subjects in the broad sense in which a plurality or manifold (a conjunctivum) is also a single logical subject. If we use the term "single" in the narrower sense in which it is equivalent to "simple," premiss (2) becomes a necessary truth within a given conceptual framework, and Cornman accepts it, though without noting the italicized qualification. He also accepts premiss (3). Accordingly, it is premiss (1) which bears the brunt of his scrutiny.

Do I accept this premiss? Here is where Cornman's "omitting for the sake of simplicity the requirement that we talk about counterparts in different images" leads him to misconstrue my thought, although it must be confessed that in the argument as I formulate it, I do not guard against this misconstruction. Thus, although I clearly hold that "to sense redly" as a predicate in the Manifest Image is predicated of single (simple) logical subjects, it is open to me to hold (as I do) that to this predicate, as to others in the Manifest Image, there corresponds in the Scientific Image a successor predicate of the same design which is predicable of persons as pluralities of logical subjects. If this possibility is taken into account, (1) would be true on the "manifest" interpretation but false on the "scientific" interpretation; and on the interpretation in which it is true, (4) would not follow. On the other hand, if the verb "to sense redly" is restricted to its use in the Manifest Image, (4) would indeed follow from the premisses thus interpreted, but not if "to sense redly" were replaced by its non-homonymous successor predicate.

What, then of (5)? We now see that its antecedent is true only in the sense that "to sense redly" (manifest) is not predicable of persons construed as systems of scientific objects. If, now, we had reason to insist that "to sense redly" (manifest) be predicative of something in the Scientific Image, the conclusion would have to be that the latter contains certain "single" (simple) subjects of which it can be predicated—perhaps Cartesian egos, perhaps something else, though surely not the particles of theoretical physics. Cornman, construing my thought along these lines, tacitly assumes that my "sensa" are introduced to be the required subjects of "to sense redly." That this idea is intrinsically absurd keeps him from formulating it explicitly. If he had done so, he would surely have been led to rethink the structure of my argument.

What is there about the "manifest" predicate "to sense redly" which requires that its scientific counterpart make a reference to sensa, if not to Cartesian egos? Cornman in a sense sees (though only in a sense, because he is still thinking in terms of the above argument, which neglects "counterparts in different images") that it has something to do with the fact that "red" as a predicate of the physical objects of the Manifest Image is a primitive monadic predicate. Thus he attributes to me the principle that "if an aggregate is the logical subject of a primitive term, then the term must be an n-adic predicate, where n equals the number of items in the aggregate" (p. 436; he refers to RA, p. 299). He points out that I use this principle to argue that since "red" is a primitive monadic predicate, no aggregate can be the subject of "red." He correctly attacks this principle and offers a red brick wall as a counter example. He is, of course, right about this. But what he misses is the fact that in formulating this principle I was attempting to draw consequences from the strong principle of reducibility which lies at the heart of my ontology. What I should have said is that if an aggregate is the logical subject of a primitive monadic predicate, then this predicate must be true of the elements of the aggregate. Thus the red brick wall is red by virtue of the fact that the bricks which make it up are red. In the course of explaining my principle of reducibility (above, p. 20) as applied to color, I pointed out that "the concept of ultimate homogeneity is closely related to the traditional concept of a simple quality. It differs only by relating the latter to the logic of whole and part." Thus, "the uniform pinkness of a whole (the pink ice cube) does not consist in a relationship of non-pink parts." What I did not clearly see at the time of my "Reply to Aune" is that the principle is compatible with the pinkness of a whole consisting in a relationship of pink parts.

Now it would follow from this principle, correctly interpreted, that if "to sense redly" is a primitive predicate, then it
applies to a whole if and only if it applies severally to its parts. From this, in turn, it would follow that its successor predicate in the Scientific Image cannot be a primitive predicate, for the particles of nuclear physics, which are constituents of persons in this framework, can no more be said to sense redly than they can be said to be red (in the naive realist sense). The conclusion which I drew is that this successor predicate must be a defined predicate, but that the primitive character of "senses redly," which has its origin in the primitive character of "red" as a predicate of physical objects, will be preserved if this successor predicate were defined in such a way that its definitens includes a reference not only to such scientific objects as are involved in non-living matter, but also to a new domain of particulars (sensa) to which a new primitive predicate "red" applies.

If it be asked why the successor in the Scientific Image to sensing redly and, ultimately, to red as an occurrent quality of the physical objects of the Manifest Image, must preserve the primitiveness or irreducibility of color, whereas the successor concepts of a chemistry which has been reduced to microphysics become defined constructs of the unified theory, the answer lies in the distinctive character of the explanandum which called for the introduction of sense impressions in the first place."

V

In his generous attempt to patch up the argument which includes the premiss that a primitive predicate which is true of a whole consisting of \( n \) objects must be an \( n \)-adic predicate, Cornman once again shows his insight into the general structure of my position. Although he doesn't consider replacing it, as I have done, with a weaker premiss to the effect that a predicate which is true of a whole consisting of \( n \) objects cannot be a primitive monadic predicate unless it is also severally true of the objects which make up the whole, thus circumventing the counterexample of the red brick wall, he shows in other ways that he senses the key role in my argument of the strong principle of reducibility.

He begins by formulating a premiss which he is prepared to accept on the grounds that it "unpacks part of the concept of the scientific image."

(9) If the scientific image is correct, then for every description that uses a monadic predicate with a non-basic entity as subject and that is true at the non-basic level, there is a corresponding description true at the scientifically basic level that uses only predicates with individual scientifically basic entities as subjects, (p. 437)

Obviously, this premiss leaves open the possibility that at the basic level primitive monadic predicates might be true of wholes consisting of basic entities, without being severally true of these entities themselves, a possibility which my strong principle of reducibility is designed to rule out. To this premiss he adds another:

(10) If the antecedent and consequent of (9) are true, then all monadic predicates true of non-basic entities are definable by primitive predicates true of scientifically basic entities, (p. 437)

Now if we take into account the distinction between counterparts at different levels, (10) admits of two interpretations:

(10-1) If the antecedent and consequent of (9) are true, then all monadic predicates true of the counterparts of non-basic entities are definable by primitive predicates true of scientifically basic entities.

(10-2) If the antecedent and consequent of (9) are true, then all monadic predicates true of non-basic entities have counterparts at the basic level which are definable by primitive predicates true of scientifically basic entities.

It is clear that the first of these involves the red brick wall fallacy, and should be replaced by

(10-la) If the antecedent and consequent of (9) are true, then all monadic predicates true of the counterparts of non-basic entities (which counterparts are wholes consisting of basic entities) are definable by primitive predicates true of scientifically basic entities and, if they are primitive, are true severally of the entities making up these counterparts.

25 See above, pp. 399 ff.; also the concluding sections of \( IA \).
With these qualifications, I am prepared to accept both interpretations of (10), i.e. to accept (10-la) and (10-2).

Now from premisses (9) and (10) Cornman draws the conclusion:

(11) If the Scientific Image is correct, then no monadic predicates true of scientifically non-basic entities are primitive predicates, i.e. s is a logical subject of a primitive monadic predicate only if s is a scientifically basic entity.

But taking the above distinctions into account, (11) cannot be accepted as it stands, for in the Manifest Image "senses redly" is a primitive predicate true of an entity which is not scientifically basic. What we can conclude is either

(11-1) If the Scientific Image is correct, then no monadic predicates true of the counterparts of non-basic entities are primitive—unless they are true severally of the basic entities which make up these counterparts.

(11-2) If the Scientific Image is correct, then no monadic predicate true of scientifically non-basic entities has a counterpart which is a primitive predicate.

Note that (11-1) without the "unless" clause involves the strong principle of reducibility in the form in which it is open to the counter example of the red brick wall. With this qualification, it is both acceptable and does the work I want it to do. I can also live with (11-2), for while I hold that the counterpart at the basic level of the predicate "senses redly" is a defined predicate, one of the elements in its definition is the primitive predicate "red," a successor predicate which applies to sensa.

From his (11), together with a new premiss (12) to the effect that in the Scientific Image basic entities are "single logical subjects" which he accepts as analytic of the concept of the Scientific Image, Cornman concludes:

(7,a) If the Scientific Image is correct, then if s is a logical subject of a primitive monadic predicate, then s is a single logical subject. (p. 438)

But taking into account the above separation of (11) into (11-1) and (11-2), we see that the relevant alternative to combine with (12) is (11-2) and the conclusion to be drawn is

(7,a-1) If the Scientific Image is correct, then if s is a logical subject of a primitive monadic predicate, then s is either a single logical subject, or, if s is a whole consisting of single logical subjects, then the predicate is severally true of these single logical subjects.

Finally, Cornman combines his (7-a) with premiss (8) from the preceding argument, i.e.

(8) "To sense redly" is a primitive monadic predicate

and concludes

(1,a) If the Scientific Image is correct, then if s is a logical subject of "to sense redly" then s is a single logical subject (italics mine), (p. 438)

pointing out that this conclusion can play the role of the controversial (1) in the previous argument for the conclusion, (6), that "if the Scientific Image is correct, then sense impressions are particulars."

But Cornman's new argument, by failing as before to take into account the key role in my analysis of the idea of counterparts in different frameworks, assumes that if "to sense redly" is a primitive monadic predicate in the Manifest Image, it (i.e., its counterpart) must also be a primitive monadic predicate in the Scientific Image. If this were granted, then from (7, a-1) and (8), thus interpreted, it would indeed follow that

(1,a-1) If the Scientific Image is correct, then if s is a logical subject of "to sense redly," then s is either a single logical subject, or, if s is a whole consisting of single logical subjects then "to sense redly" is severally true of the single logical subjects.

Thus it is clear that Cornman's careful argument still hinges on the assumption that I would be willing to say that "to sense redly" is a primitive predicate in the Scientific Image, and hence that a basic scientific object can meaningfully be said to sense redly. As before, his common sense should have warned him that something was wrong. For it is clear from many passages, some of
them quoted by Cornman, that I construe the new objects I introduce into the Scientific Image, not as redly-sensings, but as, in a sense of "red" which is the final transposition into a new key of "red" as a predicate of manifest physical objects, red.26

Perhaps at this stage a rewriting of the passage which constitutes Cornman's primary text, a rewriting which sticks as closely to the original as it can while giving a more adequate representation of underlying thought, would be helpful. Let me try the following:

By "identifying" in the above manner a person with a plurality of logical subjects, i.e., the constituent parts of the "computer," we have undermined the logic of sense impressions. For whether these parts be construed as material particles or as nerve cells, the fact that they are a plurality precludes them from serving either jointly or separately as the subject of the verb "to sense red-rectangle-wise" [for "to sense redly" is not true of particles or nerve cells taken severally, and, being a primitive predicate it can be true collectively of wholes consisting of particles or nerve cells only if it is true of them severally] we must therefore either introduce another logical subject (an immaterial subject) to do this work, or introduce a new category of entity ("phantasms" or "sensa" we might call them) with predicates the logical space of which is modelled on that of visual impressions, as the latter was modelled on the logical space of colored and shaped physical objects. [These new particulars with their new predicates would be those elements in persons construed as pluralities of logical subjects which preserved the irreducibility of the logical space which is so patent a feature of the world of common sense experience. The counterpart in this new framework of a person sensing-a-red-rectangle-ly would be the involvement of a red and rectangular sen-sum in the total state of the person as a system of scientific objects.]

This formulation would highlight the role in my argument of the strong principle of reducibility which was given explicit formulation in "Philosophy and the Scientific Image of Man," written at approximately the same time as the essay on "Phenomenalism" (SPR, chap. 3) from which the original passage was quoted. I am puzzled that the care and ingenuity which Cornman has devoted to deriving by "extrapolation" and "interpolation" a valid argument from his compact text did not lead him to see that the above is what I had in mind. I can only account for this fact in terms of his "omitting for the sake of simplicity the requirement that we talk about counterparts in different images."

VI

Cornman next turns his attention to premiss (10), which, as I have pointed out, is closely related to my strong principle of reducibility, and which, allowing for a key ambiguity, I do accept. Cornman correctly points out that my acceptance of "something like (10)" is closely related to my "acceptance of Wittgenstein's conception of language in the Tractatus as his model for an ideally perspicuous language" (p. 438). He then writes,

Given that something like a Tractarian language provides the best and most perspicuous picture of what there is, and, as Sellsars also seems to believe, that the scientific image requires that we talk about counterparts in different images to provide, in this sense, the best picture of what there is, then (10) is justified. For given the above, the scientific image is correct only if scientific theoretical terms that predicate properties of individual scientifically basic entities are primitive predicates. All others, whether theoretical or observation terms, are defined by means of these primitive predicates, (p. 439)

Now, of course, I do not hold that terms in an antecedent framework, whether theoretical or observational, are definable in terms of a subsequently developed theoretical framework. I hold only that what is definable by means of the primitives of the subsequent framework are counterparts (successors) of terms in the antecedent framework. (That the same sign designs are used. e.g., "valence," should not mislead.) Again, I do not hold that the ontological advantage of the Scientific Image over the Manifest Image consists in the "Tractarian" character of the framework, but in its greater explanatory power. Thus, the "Tractarian" dimension of my description of the Scientific Image is an application of ontological considerations which I also apply to the Manifest Image. In this sense I grant Cornman's point that one might hold, in principle, that theoretical science will give us the
best picture of what there is, without requiring that this picture conform to the demands of logical atomism. Cornman, however, argues that "past failures give reason to think that no program of logical constructionism, an integral part of embedding any set of terms in a Tractarian language structure, will succeed" (p. 440). Thus "there is good reason to think that some [!] physical objects are not logical constructions out of sense data . . . and that neither observable entities nor theoretical entities are logical constructions out of the other" (p. 440).

I have no quarrel with Cornman's rejection of classical phenomenalism, though I would point out that the failure of phenomenalism is grounded in the specific character of its claims, and not in the general thesis of logical atomism, even though the latter may have played a key role in inspiring phenomenalistic analyses. In his second example of a failure of the logical constructionist program, he cites as the reason for this failure, the fact that "the relationship among pure observation sentences and pure theoretical sentences is logically contingent" (p. 440). The evaluation of this point hinges on the interpretation to be made of substantive correspondence rules, a topic which he takes up in the next section of his paper.

In this section (pp. 440 ff.) Cornman considers the view that "once . . . correspondence rules are established, they will, in effect, provide redefinitions of the non-basic terms they contain" (p. 440). He points out, correctly, that not everybody accepts this interpretation of correspondence rules, and that one can envisage "a unified scientific view of what there is" without committing oneself to this interpretation. He then gives a more precise formulation, buttressed by quotation and specific references, of my views on correspondence rules of the relevant kind, and points out (p. 441) that on this interpretation "all that is needed for a Sellarsian program of logical construction will be available," for correspondence rules, so construed, would enable the definition of predicates in the observation framework by means of expressions belonging to the vocabulary of the ideal theory to which all partial theories are to be reduced.

At this point he raises what he takes to be a crucial objection. He points out that my formulation "requires that all corre-

spondence rules, including those relating sensation terms to basic theoretical terms, will become definitions of the nonbasic terms they contain" (pp. 441-442). He suggests, mistakenly, that "there is some reason to think that Sellars would reject this extension of his claim." Why? "... because once all observation terms are theoretically redefined, sensation terms will have to carry all sensory meaning and thus will not be theoretically definable by correspondence rules in which they will appear" (p. 442). But this is simply a mistake, for the correspondence rules which would relate sensation terms to the constructs of an ideal neurophysiology would, according to my argument, relate them to theoretical states of affairs which include sensa. Thus, the redefinition of sensation terms by means of basic theoretical terms would preserve "sensory meaning," for that is exactly what sensa were introduced to do. It is only if the predicates of the basic theory are construed as without exception physical that "sensory meaning" would be lost by such redefinition. The fact that tough-minded philosophers take as their paradigm of neurophysiological talk such locutions as "firings of neurons" and "electro-chemical impulses," and puzzle over the possible identity of pain with "stimulations of C fibres," has tempted Cornman to" picture ideal neurophysiology in terms of complicated systems of microphysical particles, i.e., in terms of complex systems of items such as are found in stone walls.

Cornman, then, argues that to preserve "sensory meaning" I should deny that the correlation of sensations with the complex states of affairs described by ideal neurophysiology should be interpreted on a model of such theoretical identifications as might be appropriate to the reduction of chemical to microphysical theory. In effect he is attempting to confront me with a choice between treating sensations as states of a Cartesian mind, which states are correlated with complex neurophysiological phenomena, and treating sensations as irreducible or emergent states of wholes consisting of micro-physical objects. This theme comes to the surface in the concluding passages of his paper.

In the meantime he argues that if I hold that sensation terms can be redefined in terms of ideal neurophysiological theory, then premiss (8)--"to sense redly' is a primitive monadic predicate"
becomes false. But this is sheer confusion. The predicate in question is a primitive monadic predicate of persons in the Manifest Image. What would be definable is its successor counterpart in the Scientific Image. Once again Cornman has been hoisted by his policy of "omitting for the sake of simplicity the requirement that we talk about counterparts in different images."

I have pointed out that I can accept (10)—and, in particular, (10-2)—while demanding the preservation of "sensory meaning" and that I can accept (8) as true in the Manifest Image, but false in the Scientific Image. That as a result I cannot combine (10) and (8) in the Scientific Image to derive

\[(1a) \text{If the scientific image is correct, then is s is a logical subject of "to sense redly" then s is a single logical subject}
\]

leaves me unmoved. For my argument for sensa does not hinge on "to sense redly" being a primitive predicate in the Scientific Image. Cornman concludes that "this Sellarsian attempt to show that the Scientific Image requires the move from sensings as states of persons to sensa as a special kind of particular also fails" (p. 442). He adds, more accurately, that he has "not yet found reasons to reject sensings for sensa."

Undaunted, he continues the search, and comes up with another candidate. "There is, I believe, one more argument against sensing redly and for red sensa that can be extracted from Sellars' writings" (p. 443). In his delineation of this "one more argument" Cornman finally gels on target. The argument, he tells us, "centers on two consequences of Sellars' conception of the scientific image . . . the first is that if the property of sensing redly is a property of something, then it is a property of persons and is, consequently, a property of groups of basic entities. The second is the requirement that all properties of groups of basic entities are reducible to properties or relations of basic entities. In addition, he adds, "the argument is based on the premiss that no scientifically basic entities sense redly" (p. 443).

Unfortunately, Cornman continues to give curious formulations of the principle of reducibility, and to neglect the role of "counterparts in different images." He formulates the principle as follows

\[\ldots \text{if a group of basic entities has a property but individual basic entities do not, then the property is an emergent property. And if something has an emergent group property, then that property is not reducible to properties and relations of individuals in the group (p. 443)}\]

He draws from these considerations the consequence that if the scientific image is correct, no person senses redly," and then reaches back to the premiss "if no person senses redly, then sense impressions are inner particulars" to draw the conclusion "if the scientific image is correct, then sense impressions are particulars."

Now Cornman is entitled to use the term "emergent group property" as he chooses, but as he introduces it, it, is possible for a property to be both "emergent" in his sense, yet reducible to "properties or relations of individuals in the group. Thus the constituents of atoms are not atoms, yet, presumably, the property of being an atom is reducible to properties of and relations between its constituents. Or does he, perhaps, include (as I would) the irreducibility of a group property as one of the criteria for calling it "emergent"? If so, then the property of being an atom would not be an emergent property, although it is a property lacked by the constituents of an atom. Only on this condition would it follow from something being an emergent, property that it is not reducible.

In his formal development of the argument, Cornman neglect the distinction between "senses redly" as a predicate in the Manifest Image, and its successor predicate in the Scientific Image. My argument is to the effect that we must choose between construing this successor predicate as standing for an emergent property of groups of physicals scientific objects and construing it as standing for a reducible property of groups of scientific objects which include sensa. I certainly do not conclude that
"nothing, and \textit{a fortiori} no person, has the property of sensing redly" (p. 444).

The formal argument he attributes to me has as one of its premisses

(5) If something has an emergent group property, then it has a group property that is not reducible to properties and relations of the individuals of the group, (p. 444)

I have already pointed out that this premiss is false unless it is made part of the definition of "emergent." But Cornman proceeds to examine it carefully, thus implying that I hold the following (absurd) principle

. If a group of individuals has a property which the members of the group do not, then the property is not reducible to properties of and relations between these members.

(This move of Cornman can be traced back to his original discussion, on which I have already commented, of my principle of reducibility.) He then argues that (5) gets apparent support from the fact that "there seems to be no way to define emergent properties, such as phenomenal properties, by physical properties," but counters with

This is not, however, the case, because using another claim by Sellars we can show that a definitional reduction of some properties is plausible, and thus (5) would be refuted. (p. 445)

He proceeds to introduce distinctions related to my distinction between "physical,\textsuperscript{1}" and "physical,\textsuperscript{2}," and to introduce corresponding senses of "emergent." But he correctly points out that none of this helps save (5), since as he is interpreting (5) it is subject to the counterexample of the reducibility of the temperature of a gas to the mean kinetic energy of the molecules of the gas (p. 446).

Thus, as Cornman sees it, the issue finally boils down to the question whether there is something distinctive about "phenomenal properties" such as "sensing redly." He reminds us that, according to my argument, "all aspects of the meanings of empirical terms involving sensible qualities, such as felt temperature and seen color must be expunged if observation terms such as 'gas' and 'table' are to be defined by physicals theoretical terms, i.e., by "predicates adequate to the theoretical description of the individual basic level particles of physics" (p. 445). Nevertheless, "some terms must involve some kind of counterpart of sensible physical properties . . . because something relevantly analogous to sensible physical properties is needed to explain, among other things, being under the impression that a table is red" (p. 447). This job can initially be done by the sensation terms of the Manifest Image. But what happens when the impact of the Scientific Image on the concept of a person is taken into account? Here Cornman sees me as arguing that

. . . at this final state of science, sensation-terms, although related to certain physical, terms by correspondence rules, are not definable by those physical,\textsuperscript{1}, terms, because there is no further limbo to which the sensible quality aspects of their meaning can be relegated. According to this argument, then, if the scientific image is correct, sensing redly is an emergent, property of a group of basic or physical,\textsuperscript{2}, entities and is not reducible to any physical,\textsuperscript{1}, properties or relations. (p. 447)

He sees me as combining this conclusion with

(6) If the scientific image is correct, then all properties of groups of scientifically basic entities are reducible to properties or relations of individual scientifically basic entities, (p. 444)

and inferring that

(7) If the scientific image is correct, then nothing, and \textit{a fortiori} no person, has the property of sensing redly.

Now I have already pointed out that my conclusion was not that sensing redly is an emergent property, but that the counterpart in the Scientific Image of sensing redly is \textit{either} an emergent (irreducible) property of groups of microphysical particles, or it is a reducible group property of scientific objects \textit{which include sensa}. I did, indeed, use something like (6), but not to argue that "nothing . . . has the property of sensing redly."

In preparing his penultimate reshaping of my argument,
Cornman writes that the above version involves a "claim about the nondefinability of sensation terms" (p. 447) although on his own showing it involves only the weaker claim that "they are not definable in physical terms." The stronger claim suggests to him the following revision:

(5,a) If something has the property of sensing redly, then it has an emergent group property of scientifically basic individuals [the "particles of physics"] that is not reducible to properties of individuals that compose the group. (p. 447)

(6,a) If the scientific image is correct, then all properties of groups of scientifically basic entities [the "particles of physics"] are reducible to physical properties of individual scientifically basic entities. (p. 448)

(7) If the scientific image is correct, then nothing, and a fortiori no person, has the property of sensing redly. (p. 444)

He proceeds to examine premiss (6,a), the revised form of (6) necessary to derive (7).

VII

What is the difference between (6) and (6,a)? Cornman tells us (p. 448) that "where (6) merely requires of the scientific image the reduction of group properties to properties of basic level individuals, (6,a) requires a reduction to physical3 properties," where

\[ P \text{ is a physical property } =_{df} P \text{ is a physical property expressed by one of a set of predicates adequate} \]

P to the theoretical description of the individual basic level particles of physics. (p. 445)

and where

\[ P \text{ is a physical property } =_{df} P \text{ is a property expressed by one of a set of predicates adequate to the theoretical description of non-living matter} \]

(p. 445)

In his footnote at this point Cornman correctly points out that "adequate" must here and in the following definitions be interpreted as "minimally adequate."

At this point Cornman finally sees that

\[ \ldots \text{nothing in the Sellarsian argument that the emergent, property of sensing redly is not definitionally reducible to physical, properties prohibits the definition of sensing-terms by theoretical terms that apply to scientifically basic individuals, where there is an adjustment in the meaning of both sets of terms.} \]

One way for such an adjustment to occur would be for some basic level terms to acquire some counterpart of the sensible quality meaning of sensation terms. Thus, the property of sensing redly might in this way be definitionally reducible to properties of scientifically basic entities. (p. 448)

Now this, of course, was exactly the strategy of my argument, and the fact that, when he arrived at this point, Cornman did not reconsider the tortuous interpretation he has "extrapolated from and interpolated into" my writings on this subject, baffles me. For it is exactly on this ground that I introduce sensa in the theoretical account of what it is for persons to have sensations.Cornman, on the other hand, is so taken by the idea that "scientifically basic entities" must be the "basic level particles of physics," that instead of making this move, he suggests that the "basic level terms" which "acquire some counterpart of the sensible quality meaning of sensation terms" are predicates which -express "properties of basic-level individuals" (pp. 448-449). These properties, he points out, "would not be physical, but merely physical," And by not countenancing the introduction of new basic individuals (my sensa) to serve as the subjects for these predicates, he implies that these properties would be properties of the particles of physics. It is these particles, or some of them, which would have counterparts of the sensible qualities of the Manifest Image. They would be what is really red (or sweet or loud, etc.)! Surely the move to sensa is more reasonable!

Still obsessed with pinning me down to the conclusion, (7), that "if the scientific image is correct, then nothing, and a fortiori no person, has the property of sensing redly," Cornman now suggests a stronger version of (5,a) which explicitly excludes the possibility of reducing sensing redly to any properties of scien-

27 See, in particular, IA, sections 48 ff.
tically basic entities, whether or not these properties are physical, physical, or only physical.

(5,b) If something has the property of sensing redly and this is an emergent group property of scientifically basic individuals, then something has a property that is not reducible to any properties of individual scientifically basic entities, (p. 449)

By moving to (5,b) the argument no longer requires (6,a), but can revert to (6). But, Cornman now argues, the objection raised above against (6,a) now applies to (5,b). Even if it is granted that sensing redly is not reducible by redefinition to physical properties (or relations) of individual scientifically basic entities, what reason have I given for supposing that it is not so reducible to properties or relations of these entities, when the qualification "physical" is removed? To his challenge my reply is essentially the same as I have made to his objection to (6,a). It is absurd to hold that the "sensible quality meaning of sensation terms" is transposed, in the Scientific lineage, into "properties or relations of individual scientifically basic entities" where these entities are construed as "the basic level particles of physics." If, on the — other hand, (5,b) is so interpreted that the class of "scientifically basic individuals" can include particulars other than these particles, then I reject it. For these new entities could be tailor-made to serve as the subjects of the predicates which inherit the "sensible quality moaning of sensation terms." In other words they could be the sensa for which I was arguing.

Notice that sensa, thus introduced, would be physical, but not physical, or physical. Would they belong to the subject matter of (ideal) physics? Clearly they would not be particulars, but who would wish to pin physics down to a particulate framework. It is also clear that sensa would only occur in the context of sentient organisms. But should we exclude sentient organisms from the subject matter of physics? One may do so if he wishes, as one might exclude chemical reactions from the subject matter of physics. But the grounds which one would give to justify these exclusions would concern either, more superficially, the institutional structure of science as an academic enterprise, or, less superficially, the methodologies which differentiate sciences.

But from the standpoint of the theoretical content of science, the "reduction" of chemical theory to micro-physical theory would, on my interpretation of this term, warrant the statement that chemical reactions belong to the subject matter of physical theory. In this sense they would be part of the subject matter of "physics." The case of sentient organisms provides an interesting variation, which I have explored in IA. For, if my argument is correct, the successful reduction of the theory of sentient organisms to a theory which includes the physical predicates of (ideal) micro-physics would necessarily involve the introduction of additional predicates which are not physical, i.e., which do not belong to the minimal set adequate to describe non-living matter. Shall we characterize this enriched framework as a "physical theory"? I see no reason not to, but this is a consequence of (the specific character of the Scientific Image as I have sketched it.

If (as I do not believe) it should turn out, for example, that the behavior of persons requires for its description and explanation "mental acts" having an "intentionality" which can not be explicated in terms of the forms and categories of an extensional logic, then it would be odd to include these "mental acts" as part of the subject matter of a "physical theory," and to speak of them — as "physical" events. To do so would be to throw away all the connotations of "physical" save that of belonging to the spatio-temporal-causal order, i.e., to equate "physical" with "physical" or, in effect, "natural," as contrasted with "supernatural." Surely we would prefer to characterize the unified theory as, e.g., "psychophysical theory," and use "physical theory" to designate that part of "psycho-physical theory" which was adequate to unthinking things.

Now if my account of the reduction of the framework of sensations to a unified theory of sentient organisms is correct, considerations like the above would not apply. For according to this account the logic of sensa can be explicated in terms of the forms and categories of an extensional logic. There would not be the same compelling reason to deny that sensa are "physical" and to exclude them from the subject matter of "physical" theory. But these terminological considerations have only an esoteric interest. The important thing is not to let our reflections on the developing
Scientific Image of man-in-the-world be tied too closely to the current institutional and methodological structure of science, or, above all, to its current categorial structure. It is in this spirit that I wrote, in one of the chief papers cited by Cornman,

... if it should turn out that particles instead of being the primitive entities of the scientific image could be treated as singularities in a space-time continuum which could be conceptually "cut up" without loss—*in inorganic contexts at least*—into interacting particles, then we would not be confronted at the level of neurophysiology with the problem of understanding the relation of *sensory consciousness* (with its ultimate homogeneity) to *systems of particles*. Rather, we would have the alternative of saying that although for many purposes the central nervous system can be construed without loss as a complex system of physical particles, when it comes to an adequate understanding of the relation of sensory consciousness to neurophysiological process, we must penetrate to the non-particulate foundation of the particulate image, and recognize that in this non-particulate image the qualities of sense are a dimension of natural process which occurs only in connection with those complex physical processes which, when "cut up" into particles in terms of those features which are the least common denominators of physical process—present in inorganic as well as organic processes alike—become the complex system of particles which, in the current scientific image, is the central nervous system. (*SPR*, p. 37)

**VIII**

Cornman concludes his paper by asking whether the arguments he has been examining might not "provide the grounds for a sound argument against materialism," (p. 450) even if they don't establish that "nothing . . . has the property of sensing redly." He suggests the following argument:

If materialism is true, then because we cannot eliminate both sensa and sensings and cannot reduce, sensa [i.e. reduce the properties of sensa to physical, properties] we must reduce, sensings [i.e. reduce sensings to physical, properties]. But we have just seen that the property of sensing redly is not definitionally reducible to a physical, property. Therefore materialism is false, (p. 450)

He raises three brief objections to this argument.

The first objection is to the effect that

... even if it is true, as we have been assuming while discussing Sellars' argument, that the only way open at this point to save materialism requires a reduction of the property of sensing redly to a property that is at least physical, it is not clear why a reduction, which entails identity, could not also be contingent, (p. 150)

This, I must confess, I do not understand. If ("as we have just seen") the property of sensing redly "is not definitionally reducible to a physical, property," can it nevertheless be reduced, in a sense "which entails identity," to a physical, property, "as we have been assuming" it must be, if "materialism" is to be saved? Cornman suggests that sensing redly might be *identical with* a physical, property without being definitionally reducible to a physical, property, provided that the identity in question is "contingent." Now it is indeed true that if "sensing redly" had the sense of a definite description, standing, perhaps, for the property which (in addition to satisfying certain other conditions) is normally realized by looking at red objects with open eyes, then sensing redly could be contingently identical with a physical, property, without "senses redly" being definable in physical, terms. But if the physical, property with which the described property is identical lacks, as being physical, the "sensible quality" dimension which (as Cornman has been granting) it would have to have "because something relevantly analogous to sensible physical qualities is needed to explain... being under the impression that a table is red," then any property which is *identical* with it, however the property be *identified*, must also lack this "sensible quality" dimension. Thus, if the saving of "materialism" requires that sensing redly be identical with a physical, property, the effort to save it would require a reexamination of all the concessions which Cornman has made in the course of his attempt to discover (or invent) a Sellarsian argument for sensa. Thus, the inability of physical, properties to "explain . . . being under the impression that a table is red" stands behind Cornman's willingness to say, in presenting the above argument against materialism, that "we have just seen that the property of sensing redly is not definitionally reducible to a physical, property." My present point,
is that surely the same consideration militates against saving "materialism" from the above argument by allowing the "materialist" to counter its first premiss with the claim that sensings can be reduced to physical properties in a sense that requires them to be identical with physical properties, provided that the identity be contingent.

Of course, if "reduction" to a physical property is interpreted in some such weaker sense as "correlated by a bridge law with a physical property," then a "materialist" could admit, at the expense of accepting epiphenomenalism, that sensings, though reducible, are not identical with physical properties.

Cornman does not press his first objection to the above argument against "materialism," because he thinks that "there is a problem about the requirements of property reduction" (p. 450). And he is quite right about this. How are we to interpret the claim, for example, that chemical properties are reducible to micro-physical properties? "Reduction" is clearly a technical term, and philosophers of science give different accounts of when one item is "reducible to" another, and of what, exactly, is to be meant by a statement to this effect. Cornman, therefore, looks to the possibility of saving "materialism" from some such argument as the above by approaching the first premiss

if materialism is true then because we cannot eliminate both sensa and sensings and cannot reduce sensa, we must reduce sensings

in terms of alternative accounts of reduction.

His first move, along these lines, is to argue that

Although there may be a form of reductive materialism that entails the reduction of properties, it does not seem that all forms do. (p. 450)

Notice that Cornman is focussing his attention not on alternative accounts of "reduction," but rather on alternative accounts of what is "reduced." Thus he thinks it helpful to distinguish between "properties" on the one hand, and "states" and "events" on the other. He suggests that reductive theories can hold that "states and events, such as some person sensing redly" can be reduced to physical states and events, while denying that "such a reduction entails a reduction of the properties, such as the property of sensing redly" (p. 450). But it is not clear to me how the state or event of some person sensing redly can be reduced in a sense "which entails identity" to a physical state or event of a system of scientific objects, without a corresponding reduction of properties. It is indeed true that the categories state and event are more appropriate to sensing redly than is property. But, then, logicians tend to use the word "property" to refer to anything which can be exemplified by or characterize an object, and it is not clear that there is a difference that makes a difference to the problems with which we have been concerned, between something's having a property and something's being in a state. Cornman's subsequent remark that

If, as I claimed in discussing principles of reducibility, the reduction requirement of the scientific image can be met by the reduction of entities having properties to basic level entities having basic level properties or relations, and if, as also seems true, such reductions do not entail property reductions, then property reductions are not required by the scientific image, (p. 451)

does not explain how "entities having properties can be reduced to basic level entities having basic level properties or relations in a strong or weak sense of reduce, without entailing property reduction in a correspondingly strong or weak sense. As far as I can see, the only virtue of stressing the reduction of 0 having P rather than of P simpliciter, and it is a virtue, is that trans-framework reduction involves both the subject and the predicate of the reduced statements. But this is something I have stressed right along. It is only because he does not pay sufficient attention to the distinction between the trans-framework sense of 'reduction' rooted in the philosophy of science, where one speaks of one theory as being reducible to another, 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," that Cornman was able to take my paraphrase of the latter

. . . roughly, every property of a system of objects consist, of properties of and relations between its constituents. (SPR, p. 27)
to be a precise formulation of what I think to be reducible to what in both contexts, infra-framework and inter-framework.

As for "event," the situation is somewhat more complicated. Abstracting from the fact that "event" unlike "state" connotes change, so that it is not clear that we would want to speak of someone sensing redly as an event, we notice the more important difference that an event (e.g., a jumping), unlike a state or property, is not something which can be shared by two individuals —though, of course, two individuals may be involved in the same event, e.g., one as murderer, one as victim. But if we take into account the difference between event-kind and event-occasion, which is lacking in the case of "states," it is not clear that there is a difference which makes a difference for our problem between something's having a property and, for example, something's being the doer of a deed or something's being the subject of a rapid change. The question persists: could someone's being in the stale of sensing redly or someone's being involved in the sensing redly kind of event be reduced in a sense "which entails identity" to an object's being in a physical, state or being involved in a physical, kind of event, without the reduction of sensing redly itself to something physical,---whether or not you choose to call it a property. Surely it is reduction itself, and not whether" it is properties, states or events which are reduced, which is the crux of the matter.

Cornman's third objection calls attention to the fact that "there are other forms of materialism, such as those that attempt to eliminate sensations rather than reduce them, which do not require any sort of reduction" (p. 450-451). True, but these other forms must show that sensations are not needed to perform the explanatory role which is traditionally assigned to them, or, rather, to perform that which remains of this explanatory role when the tradition has been purged of the mistakes which have made it so unappealing. If all that is meant by "eliminating" sensations is that the job they do can be better done by a successor account in scientific terms, then we are back with something like reduction in the sense I have attempted to define, and which is increasingly involved in the successive refinements of Cornman's

argument. Once again the problem would arise whether this successor account is in physical, terms.

IX

Cornman begins his concluding summary with a statement . . . none of the arguments that I have constructed based on Sellars' writings, even those assuming that the scientific image is correct, suffices to justify premise I of the Sellarsian anti-materialism argument: "If scientific realism is correct, then sense impressions are particulars."

I have already pointed out that I have offered no argument against "materialism." Indeed, if it were not for my strong intra-framework reducibility principle, I could accept a materialism according to which certain systems of physicals scientific objects have the irreducible physical, but not physical, property of sensing in its various modalities. (Whether or not conceptual activity should also be construed, by such a materialism, as irreducible to physical, properties of and relations between physical, objects, is a topic which Cornman does not raise, and on which I have not touched in this reply, although I have discussed it on a number of occasions) I also see no reason why the introduction of sensa as non-physical, objects characterized by properties which are the ultimate inheritors of the "sensible quality" meaning of the proper and common sensibles of the Manifest Image, precludes the use of the term "materialism." After all, Hobbes is construed as a materialist, in spite of his introduction of "phantasms" or "appearances"—though it is not clear that he construed them as immaterial particulars, rather than (with holistic materialism) as unique states of certain highly organized material systems.

29 This is not quite true, since, as was pointed out above, another motive is to reach a framework in which the inference from "Jones senses a red rectangle" to "there is a red rectangle which Jones senses" is valid.

30 Since there is an obviously close connection between sensory states and certain forms of conceptual thinking (e.g., in perception and in practical reasoning), the questions are not as separate as computer analogies might suggest.
Sensa are not "material" as "matter" as construed in the context of a physics with a particulate paradigm. But, then, as has often been pointed out, the more seriously this paradigm is taken, and the more classically it is construed, the less "matter" there seems to be. It is obvious that as long as the term "materialism" is tied to the term "matter," its usefulness hinges on the flexibility of the latter term; its ability to stand for successor concepts as the conceptual structure of the theory of material things evolves. On the other hand, if its ties with "matter," construed in terms of classical paradigms, are loosened, its usefulness hinges on its standing for a type of world picture which contrasts with non-materialism in a way which preserves the force of the classical materialist claim that the ultimate logical subjects involved in sensation, feeling, emotion, and conceptual thinking are "physical," in a sense of "physical" which does not so trivialize it that it would apply to Cartesian minds. Until these issues are squarely faced, the term "materialism" is likely to cause more heat than light, and to serve political rather than philosophical purposes.

That in spite of his exploration of the distinction I have drawn between "physical," and "physical," and his recognition that it plays a key role in my conception of the problem of the ultimate status of sense impressions, Cornman can conclude his paper by reiterating the charge that

Sellars provides no way to justify premiss IV: "no particulars which are sense impressions or sensa are identical with physical phenomena." (p. 451)

is difficult to understand. I have already pointed out that early in his paper he admits in a footnote that

strictly speaking, Sellars would reject this identity claim [the claim that sensa are identical with certain brain entities] only if the relevant brain entities are what he calls physical, entities. He claims that there is a sense in which sensa are brain entities (IA, sects. 28-32) and a sense in which they are physical, i.e. physical, (p. 421, n. 7)

Surely Cornman should have reasoned

Sellars claims that sensa are physical, though not physical,. Therefore he does not hold "Premiss IV" unless "physical phenomenon" is construed as "physical" phenomenon." Therefore, he does not argue against materialism, unless materialism is construed as holding that. correctly understood, sensations are physical, phenomena.

But, of course, had he reasoned in this way he would have written a different paper.

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