

Chapter Seven  
How we make our ideas clear:  
Epistemology for Empirical Concepts<sup>1</sup>

' 7.1 the Complaint Against Externalism

The view of substance concepts I am offering is an uncompromisingly externalist view. What makes a thought be about a certain substance is nothing merely in the mind, nor any mere disposition of the mind, not even a wide disposition, but the thought's originCan external causal/historical relation between the concept and the substance (' 4.8). But meaning externalism has recently come under heavy attack on the grounds that it leaves thinkers in no position to know themselves either what they are thinking about or whether they are genuinely thinking at all. And indeed, the best-known externalist theories all do seem to have this consequence. There is no necessity for an externalist thesis to have this consequence, however, and I propose to show how to avoid it.

What is needed to counter this entirely reasonable complaint against meaning externalism, I believe, is first an adequate account of what would constitute knowing what one is thinking of. If you are directly thinking about an external object, knowing what you are thinking of obviously cannot be done as Russell once described it, by having the object of thought literally within or before your conscious mind. Nor, a fortiori, can it be done by simultaneously holding your thought, or a thought of your thought, before your conscious mind, on the one hand, and comparing it with its object, also held before the mind, on the other. What on earth then could knowing what one was thinking about possibly be? Gareth Evans devoted much of The Varieties of Reference (1982) to this question, and I will devote much of Chapter Thirteen to comparing his and my views on the matter.

A second thing that is needed to counter this complaint against externalism, I believe, is an adequate empiricist epistemology for empirical concepts, with which one's particular externalist position must, of course, be compatible. The externalism I have described implies, first, that there is no a priori guarantee against reference failure for substance concepts. It is always a priori possible that one's substance conception is not in fact connected to any real substance at all. Second, there is no a priori guarantee against reference duplication for substance concepts, no guarantee against unknowingly referring over again to exactly the same thing with two substance concepts. Third, there is no a priori guarantee against equivocation in reference, against thinking of two substances as if one, merging them together in thought. Elsewhere I have argued at length, moreover, that any kind of externalism proposed for any kind of empirical concept will necessarily have these three consequences (Millikan 1993a, Chapter 14). If this is so, then it is clearly incumbent on the externalist to show how evidence for the nonemptiness, nonredundancy and univocity of our empirical concepts can be gathered through experience.

The externalist is obliged to construct an empiricist epistemology of concepts. This

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<sup>1</sup> This chapter draws heavily on The Tenth Annual Patrick Romanell Lecture (Millikan 1998c) with the same title, delivered to the American Philosophical Association, December 30, 1997.

epistemology, I will claim, must be different from and prior to traditional empiricist epistemologies, which are all epistemologies either of judgment or of theories taken as wholes. This chapter is devoted to the task of constructing such an epistemology. I will develop it entirely independently of the theses already laid down about substance concepts, as a story about empirical concepts generally. In the end it will be apparent, however, that only a rather special kind of thesis on the nature of externalist meaning would be compatible with such an epistemology. Indeed, the only one I know of is the present one, and a similar theory for concepts of empirical properties presented in (Millikan 1984, Chapters 14-17).

The complaint against meaning externalism is often put in a rather different form, however, a form in which it is not legitimate. It is said that meaning externalism deprives us of "in corrigible access" to our own thoughts and that this result is untenable. What seems to be meant is that making the transition from having a thought to correctly representing to oneself that one has that thought is problematic on an externalist view in ways it is not problematic on an internalist view. But this is clearly mistaken. To begin with, it is far from clear that we have "in corrigible access" to our own thoughts, if that means that we can't be mistaken about them. Not only the Freudian tradition but a host of modern experiments on cognitive dissonance attest that we certainly can be mistaken.

Nor is it any consequence of externalism that access to knowledge of our own thoughts must be through the same channels as access to knowledge of others' thoughts. Externalism does not prohibit having a different and more direct way of gathering information about your own thoughts. Sellars, for example, held that you could interrupt your dispositions candidly to speak your mind and turn them into dispositions to tell yourself what you believe (1975). Indeed, barring the Cartesian position that mind is epistemically transparent to itself that the knowing of things mental just equals the being of these things externalist and internalist would seem to have exactly the same problem of explaining how one acquires concepts of the mental something that we know small children don't have and how one successfully applies them to oneself. Even if what thought is about were determined within thought itself, that would not help us with how thought reflects on itself, how it comes to know itself as object (see also Gibbons 1996).<sup>2</sup> Of course the externalist cannot tell a priori that a second order thought, a

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2. I am grateful to Keya Maitra for focusing my attention on this point. More generally, it is dismaying how many contemporary discussions of the nature of consciousness, qualia, intentional attitudes, and so forth ignore the question how one gets from the supposed presence of this or that within the mind or consciousness to propositional knowledge of

thought about the content of a first order thought, has content if she cannot tell whether the first order thought has content. But that is a different problem. It is the problem I have already promised to address in this chapter, not something new.

Bill Lycan has reminded me of one more sort of problem that has been posed for the externalist about correctly representing one's thoughts to oneself. Suppose that I have been living on earth but wake up on twinearth one day. After a time, many suppose, what used to be my thoughts of water will metamorphose and become thoughts of twater. Then when I think that last year I thought that twater was wet I will be wrong, for in fact what I believed last year was that water was wet. On the contrary, I suggest, when more than one substance has been tracked under the very same concept, the concept has become equivocal. Equivocation in thought is a very common occurrence, certainly not one that should be ruled out by either internalist or externalist. Each semester when I acquire a new class of freshmen I go through it again, making embarrassing mistakes because I have got Johnny and William or Susan and Jane mixed together in my mind. If they abduct me to twinearth I will soon have an equivocal thought of water/twater and I will be wrong when I believe I used to think that water/twater is wet. My thought did not used to be equivocal. The same thing may happen right here on earth if I know Dr. Peters for some time before meeting, unbeknownst to me, his identical twin, Dr. Peters. It is surely a strength rather than a weakness of externalism if it accounts for this sort of phenomenon.

What really is a problem for externalism, as I have said, is that it implies we cannot tell by a priori means alone (a) when our thoughts are empty of content, (b) when we are thinking double, that is, when psychologically separate thoughts of ours bear exactly the same contents, or (c) when we are equivocating in thought, representing two different contents with only one thought. The externalist owes us an account of how these various things can be discerned empirically. Can empiricist epistemology for empirical concepts. Such an account will not be obliged, however, to assuage the insistently bleak Cartesian skeptic. Given naturalist premises, no theory of mind could do that in principle. But in Kantian spirit, we are obliged to show how it is possible that our meanings are tested through experience.

### ' 7.2 Sidestepping Holism in the Epistemology of Concepts

Traditional empiricism holds, of course, that our abilities to think of external objects and properties are acquired with the help of experience. From this one might think it a short step to the view that ongoing experience is also used in testing and perfecting these abilities. The externalist challenge would then be to develop a theory of the nature of

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that presence.

empirical concepts that explains how this testing and perfecting is possible, indeed, how it manages to be highly effective and efficient. Instead, the best-known externalist theories of how thought gets its content make a complete mystery of this matter. To ground our meanings, they seem to suggest, we would need to make prior judgments about causal or historical relations of our thoughts to their objects. Or we would need to judge that the conceptual roles of our thoughts matched corresponding relations among their objects. Such demands are regressive, of course, requiring prior grounded concepts of the same objects. Also prior grasp of a true theory of meaning and reference for thought.

Yet I think that a better externalist theory is surprisingly close at hand. With just a tug and a tweak, it falls right out of the central 20th century American tradition of philosophy of science and language, beginning with the familiar story about theoretical terms told at midcentury, for example, by Carnap, Hempel and Sellars.<sup>3</sup> On this story, theoretical terms, such as "mass" "temperature" and "atom," acquire their meanings, first, from the place each holds in (what can be reconstructed as) a formal system containing postulates and rules that fix their intratheoretical relations to other theoretical terms and, second, from their inference relations to observation sentences, or to sentences in a prior theory already anchored to observation. These latter rules correlating theoretical with observational sentences were termed "bridge principles." In opposition to Carnap and earlier verificationists, Hempel then claimed that it was not possible to separate either the intratheoretic laws or the bridge principles of such a theory into two distinct kinds, meaning postulates or matters of definition on one side, empirical postulates or matters of experience on the other. For example, the meaning of the geologist's term "hardness" is determined partly by the intratheoretic law postulating the relation harder than as transitive, but also by the bridge principle that if one mineral scratches another it is harder than the other. Together these two principles imply that the relation x scratches y is transitive, a fact that is clearly empirical, yet neither principle is more definitional of the geologist's concept hardness, nor more an empirical fact about hardness, than the other. "Theory formation and concept formation go on hand in hand; neither can be carried on successfully in isolation from the other. ...If...cognitive significance can be attributed to anything, then only to entire theoretical systems" (Hempel 1950, 1965, p. 113). A more familiar quote is from Quine, who takes concepts of ordinary observable objects to be like theoretical concepts: "Statements about the external world face the tribunal of sensory experience not individually but only as a corporate body" (Quine 1953). In Quine, this thesis is again tied to the rejection of a clean distinction between changing your meanings and changing your empirical beliefs, between the analytic and the synthetic.

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3. In "Empiricism and the Philosophy of Mind" (1956), Sellars lists among advocates of this view also Braithwaite, Norman Campbell, and Reichenbach. A simple exposition of the theory is in Hempel (1966) Chapter 6.

One result of this midcentury doctrine was a disastrous semantic holism. The meaning of each empirical concept was taken to be determined only through its position in a wide inference network containing numerous other concepts, indeed, perhaps all of one's concepts. But another result was the implicit emergence of the first genuinely empiricist epistemology of concepts. If empirical meanings cannot be disentangled from empirical theories, then if theories can be some more and some less adequate so can concepts, and the adequacy of an empirical concept will be tested through ongoing experience, not a priori. But because of the holism, this empiricist epistemology of concepts is not useful against current attacks on meaning externalism. It suggests that we would need to arrive at the end of Peircean inquiry before knowing whether any of our concepts are adequate, hence before knowing whether we are genuinely thinking about anything at all. We need, I suggest, to take the baby from the bath, keeping the thesis that meanings are tested empirically but discarding the holism. Another look at the classical theory of theories suggests how this can be done.

The paradigm bridge principle bridging from observation to theory was taken to correspond to an operation either determining a theoretical property or measuring its numerical value. As a theory matures, it was supposed, typically it accumulates more and more operational bridge principles of this sort. For example, one would expect geologists to accumulate more ways of determining hardness than by scratching, as there are numerous different ways to measure temperature, distance, volume, pressure and mass. Given the Hempelian position, none of these operations will be more central than others in determining the meaning of the theoretical concepts they collectively define. Take, then, any such set of operational bridge principles helping to define a single theoretical proposition and consider it in isolation from the rest of its encompassing theory. Consider, for example, all the known ways of determining that a certain thing's temperature is 40 degrees centigrade. Surely the convergence of all these ways to the same result when applied to the same physical object attests to the reality of the property temperature 40 degrees centigrade quite independently of our knowing any intratheoretical laws about temperature. The objectivity of concepts such as temperature or mass or length is strongly evidenced quite separately from theories employing these concepts. Or better, one's readiness to judge the same proposition true on multiple observational bases itself constitutes a sort of minitheory, namely, the theory that if p then q, for exactly that one proposition. The minitheory is confirmed when a variety of empirical methods consistently converge on this single result.

It will be objected perhaps that new operations determining interesting physical properties typically are known to determine them only through the application of theory. But surely, here it does help to distinguish the context of discovery from the context of justification. How a measuring method is discovered and how it is explained are neither of them relevant to confirming its accuracy. That the measure is good, that it correlates with other measures, is fully compatible with failure of the theory that predicts and attempts to explain this fact.

For nontheoretical concepts, the ability to make the same perceptual judgment from different perspectives, using different sensory modalities, under different mediating

circumstances such as different lighting and acoustic conditions, offers similar evidence for the objectivity of the concepts employed in these judgments. Holism is easily avoided in the epistemology of concepts so long as there exist empirical propositions, each of which can be judged by a variety of independent methods not employing prior empirical concepts, making possible an independent test of the concepts contained in that particular proposition. It is not the job of empirical concepts to help predict experience. We do not predict our experience. We predict what we will read off our experience, namely, that since  $p$  then  $p$ . We do not predict the appearances of things. We could not possibly do so, for we cannot predict the ever-changing conditions under which we observe them. We predict only the truth of distal facts.<sup>4</sup>

### ' 7.3 Separating off the Epistemology of Concepts

It is important in this context not to entangle the epistemology of concepts with the epistemology of judgment. Consider, for example, the following passage from Wilfrid Sellars:

...if [having the concept of green] presupposes knowing in what circumstances to view an object to ascertain its color, then, since one can scarcely determine what the circumstances are without noticing that certain objects have certain perceptible characteristics (including colors) it would seem that one couldn't form the concept of [such things as] being green ...unless he already had them. It just won't do to reply that ...it is sufficient to respond when one is in point of fact in standard conditions to green objects with the vocable "This is green." Not only must the conditions be of the sort that is appropriate for determining the color of an object by looking, the subject must know that conditions of this sort are appropriate...one can have the concept of green only by having a whole

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<sup>4</sup> On this particular point, Quine (1960) seems to have had it the right way around: "Our prediction is that the ensuing close range stimulations will be of the sort that vigorously elicit verdicts of stonehood. Prediction is in effect the conjectural anticipation of further sensory experience for a forgone conclusion" (p. 19).

battery of concepts of which it is one element." [Sellars 1956, p. 275.]

Sellars' basic concern here is not that one couldn't in point of fact learn to respond discriminatively to green objects with the vocable "This is green" in standard conditions without already having a battery of concepts. Rather, it is that one couldn't know that anything was green without this. His concern is to ensure that suitable observation judgments indeed express "knowledge" in the sense that they can be "placed in the logical space of reasons, of justifying and being able to justify what one says" (Sellars 1956, p. 299). But there is no cause to suppose that the process of fashioning and honing adequate concepts presupposes the ability to justify the judgments that use these concepts. Knowing about the conditions under which one's perceptual and cognitive systems will work properly is not required for learning how to use them properly any more than knowing about the atmospheric conditions required for breathing properly is required for breathing properly (compare ' .4.3). The epistemology of concepts is prior to and not the same as the epistemology of judgments. Nor is it a criterion of adequacy for an epistemology of concepts or, more broadly, for a theory of mind, that it can lever a person out of skepticism. There is no compulsion to suppose that human minds are so built that we can't possibly fall into epistemological black holes that can't subsequently be reasoned out of. The question we need to answer about our concepts is how we do it, how we make them clear (compare: how we focus our eyes) not how we can know that we have succeeded in making them clear. Recognizing when one's thoughts are clear is not making a judgment about one's thought, nor is it knowing how to justify one's thought.<sup>5</sup> Sellars' final conclusion that "one can have the concept of green only by having a whole battery of concepts" does not follow from the premises he offers.

The mechanisms of perceptual constancy that enable us to perceive, for example, the same color, shape, voice, or moving object as being the same one through diverse proximal stimulations, diverse intervening media, and various kinds of distortions and static, exemplify our ability to make the same perceptual judgment in a variety of ways. So does our ability to use different senses to confirm the same judgment perceptually. Given a variety of ways to observe the same state of affairs, none of these methods is definitional of the concepts employed, just as on a Hempelian view, no bridge principles leading from observation into theory are more definitional of the theory's concepts than

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<sup>5</sup> In Chapter Thirteen, I will argue, likewise, that knowing what one is thinking of is not making a judgment about one's thought.

others. None of our ways of making the same judgment is distinguished as a or the infallible method of judging its content. Each is but a practical ability, more or less reliable, to identify the perceptually presented situation correctly. Each relies either on historically normal conditions obtaining for correct use of one's perceptual mechanisms, or on historically normal conditions for observing that these normal conditions obtain. Or better, being more careful, the most usual reliance is on normal conditions obtaining for the support of successful epistemic action. One knows how, physically, to maneuver oneself into conditions normal for making accurate perceptual judgments of a given kind.

Highly consistent convergence of independent methods to the same judgments serves as strong testimony to the objective univocal sources of these judgments. For example, I check my perception by moving in relation to the object, by employing others of my senses, by manipulating the object, to confirm a constant result. In so doing I not only verify my original result, but also confirm the more general abilities that constitute, in part, the subject and predicate concepts on which my judgment rests. I confirm them again when I find that another person has arrived at the same judgment as I, another way of making judgments being to believe what one is told (Chapter Six). Emptiness in empirical concepts shows up characteristically in lack of variety in the perspectives from which they can be applied. Equivocation shows up in the emergence of contradictions systematically correlated with perspectives taken. Redundancy shows up, just as Leibniz said, with the accumulation of coincident properties and the absence of contrary ones.

In Word and Object, Quine defines stimulus meaning as having two parts, "affirmative" and "negative," and he claims that "[t]he affirmative and negative stimulus meanings of a sentence (for a given speaker at a given time) are mutually exclusive" (Quine 1960, p. 33). This exclusivity results naturally from the fact that "stimulus meaning" is defined by reference to overt affirmations and denials of a sentence coupled with the assumption that a speaker won't affirm and deny the same sentence at the same time. Quine also remarks that "many stimulations may be expected to belong to neither" the affirmative or negative stimulus meaning. Notice that this "neither" category will, technically, cover cases of total confusion as well as more ordinary "can't tell" cases such as those Quine explicitly includes as "poor glimpses." The effect is that Quine overlooks the most interesting cases relevant to concept formation, namely those in which contradiction bypasses theory and appears directly at the level of observation. These are the cases having the most leverage for testing meanings, but they are invisible given Quine's tools of analysis.

How can contradiction bypass theory and appear directly at the level of observation? Easy cases are two thermometers, whether of the same or different construction, placed in the same medium but reading different temperatures, or an object that shows different weights when placed on different scales, or on the same scale, one minute from the next. So, you say, something must be wrong with at least one of the thermometers, or with the scale. Apparently they are not good measures of temperature and weight. But the only evidence we have that there are such objective properties as temperature and weight at all is that there exist ways of making thermometers match consistently and ways of making scales that weigh consistently. We can, of course, turn

to our theories about the causal properties of temperature and weight to explain why thermometers and scales agree when they do and why they don't agree when they don't.

We also may turn to theories when it is necessary to repair or calibrate our thermometers and scales. But having adjusted the thermometers and scales, whether by employing a theory, or by trial and error tinkering, or by sheer accident, no theories are implicated in the use of these instruments to confirm the objective adequacy of our concepts of temperature and weight. Similarly, making a prediction that a certain proposition will come true as a result of performing an experiment and later judging perceptually that it has indeed come true is a way of testing not only the theory but the objectivity of the concepts involved in the judgment. And these two are independent tests. That the concepts have been reaffirmed as objective does not depend on the theory itself being true. The method of prediction used may work for a reason independent of the particular theory, as ancient astronomical predictions often proved accurate for good reasons but not for the reasons the astronomers thought at the time.

Most people purchase their thermometers and weight scales knowing nothing of the principles of their construction and operation. This does not make these people's concepts of temperature and weight less well epistemologically grounded than those of the scientist. It does not give them less reason to place trust in the objective meanings of these concepts. Similarly, all of us were natively endowed with perceptual systems whose principles of operation scientists are barely beginning to fathom. Trust in the objective reference of judgments made using these systems is warranted in so far as we agree each with ourselves in these judgments: if p then p. What feels cubical looks cubical, and continues to look cubical from different angles and distances. What sounds as if in front of me looks to be in front of me and can be attained by reaching in front of me. Like measuring temperature with a mercury thermometer, a gas thermometer and a bimetallic strip. Nor are even the most basic perceptual self-agreements logically necessary. Müller-Lyer arrows measure the same length but look different lengths. After watching a waterfall closely and continuously for a minute or two, if the eyes are then fixed on a stationary object it will appear to be at once moving and stationary (Crane 1989). There is a way of focusing one's eyes on a pair of spots, one red and one green, such that there appears to be only one spot that is both red and green all over. A and B can appear to be the same color, B and C can also appear to be the same color, while A and C appear to be different colors (Goodman 1966). That the affirmative and negative stimulus meanings of any perceptual judgment are mutually exclusive is not a necessary truth but a matter of experience, and a continual reaffirmation of the objective meaningfulness of the empirical concepts used in making the judgment.

#### ' 7.4 Remaining Interdependencies among Concepts

That concepts are tested and honed in ways that do not entangle them with theories does not, in general, imply that they can be tested singly or one by one. Adequacy in concepts is tested by whether their employment makes stable judgment possible. But no judgment employs only one concept. To make the same judgment again, one must recognize its subject or subjects as being the same again and also the properties or

relations it attributes as being the same. Both subject and predicate terms must be adequate if stable judgment is to result. Equally important, that a judgment is stable implies that it might have been unstable, that one might have fallen into contradiction instead. Adequacy in concepts can be tested only if one can recognize contradiction in judgment. And this requires the capacity to recognize the complements or contraries of predicates. Let me explain.

Consider Quine's observation that many stimulations may be expected to belong neither to the affirmative nor negative stimulus meaning of an occasion sentence. One important reason is that the mere absence of affirmative stimulation does not constitute negative stimulation. Most obvious, I cannot make either an affirmative or a negative perceptual judgment if I fail to recognize its subject. If I don't see the rabbit at all, I can't judge it to be white or not to be white. Less obviously, failing to perceive that the predicate of a proposition applies to its perceived subject does not warrant judging it not to apply. I may feel the apple in the dark, know it is an apple, even know which apple it is, but I cannot judge its color by feeling. I may strike a match and look at the apple, but still not be able to see its color clearly or at all. Not observing that the apple is red does not equal observing that it is not red. To tell that it is not red I must be able to tell what other color it is instead, that it is some contrary of red or, more generally, that it is non-red, the complement of red. Having concepts of the contraries and complements of predicates is required if negation in judgment is to be possible, hence if contradiction in judgment is to be possible. To judge that it is not blue, you must be able to judge that what you are seeing is its being grey, not, say, its being in shadow. To judge that it is not round you must be able to judge that what you are seeing is its being elliptical, not, say, its being at an angle.

It follows that subject concepts can be tested and honed only along with at least some applicable predicate concepts and also complements of these. It also follows that Quine was at least close to right about the empirical status of at least one law of logic, the law of noncontradiction applied to empirical judgment. It is an empirical matter that we can carve out concepts of objects along with concepts of properties and their contraries such that the object concepts are suitable to be subject terms for empirical judgment, each consistently taking just one contrary from each of a series of predicate contrary spaces. Just as it is an empirical matter whether anything real has Euclidean structure, it is an empirical matter that there exist objects to judge about that have properties discernable as stable over a variety of perspectives. It is an empirical matter, that is, that there exist any "substances" as these were described in Chapter Two.

In Sellars' famous myth of the necktie shop, Jim teaches shopkeeper John to use the language of "looks" and "seems" after the installation of electric lights has caused John to misjudge the color of one of his neckties:

"But it isn't green," says Jim, and takes John outside.

"Well," says John, "it was green in there, but now it is blue."

"No," says Jim, you know that neckties don't change their colors merely as a result of being taken from place to place."

"But perhaps electricity changes their color, and they change back in daylight?"

"That would be a queer kind of change, wouldn't it?" says Jim.

"I suppose so," says bewildered John.

(Sellars 1956, pp. 270-71)

Here Jim convinces John to recalibrate his ways of judging color contraries, of making negative color judgments, by appealing to stability of judgment across change in perspectives and conditions as an ideal. Still, his argument for misperception rather than change of color seems rather weak. What really is the evidence that the necktie does not itself change when placed under incandescent light, that the distal stimulus is constant despite the proximal variation? Isn't that a matter of stability in distal causal properties, hence a matter of law, hence of theory? But the evidence against distal change need not digress through theory. Unless other ways can be found of observing this supposed change, unless other perspectives can also reveal it, there is no evidence for its reality. Evidence for the objectivity of objects and properties can only be obtained by triangulation, triangulation in that there is variety in the kinds of evidence for them. I have argued that triangulation can be achieved through variety in perception taken alone, and it can also be achieved by the use of theory. Presumably neither route is possible in the case of the necktie's change of color.

The myth of the necktie shop raises another and broader question, familiar to us from the earlier discussion of conceptual development (' 5.7). How does one know what kinds of properties can be expected to be stable over what kinds of perspectives and for what categories of objects? Animals regularly change their shapes over short stretches of time whereas most other physical objects do not. The material gold, as discovered in different places, has any of innumerable shapes and sizes, but is stable with respect, for example, to density, color, malleability and resistance to corrosion. The frog species Rana pipiens, as observed in different places and different times, is quite stable with respect to adult size, with respect to the variety and placement of its inner organs, and pretty much all of its behavioral dispositions, but not, say, with respect to shape (postural attitude) or the contents of its stomach. Acquiring concepts of these various substances must involve some understanding of which predicate contrary spaces are correlative to them, that is, of the "substance templates" under which they fall (' ' 1.8, 2.7), such as person, animal, animal species, plant, plant species, mineral, and so forth. Thus the claim that theories need not be involved in the development and testing of empirical concepts does not imply that no concepts are interdependent.

On the other hand, the ability to reidentify substances is required to guide practical as well as theoretical activities. The practical use of the capacity to reidentify important individuals, kinds and stuffs probably long predates theoretical conception, ontogenically as well as phylogenetically. In order to accumulate knowledge over time of how to deal with any individual or kind or stuff, also in order to apply what has been learned, an animal must be able to reidentify it over various encounters under a wide variety of circumstances. Practical tests of the adequacy of substance concepts are

independent of other concepts, thus providing a certain sort of foundationalist base for the conceptual abilities later employed in theoretical knowing.