

USELESS CONTENT

A central claim of teleological theories of content, certainly of my own theory, is that the content of a representation is largely determined by the design of the interpreting systems with which the systems producing the representation are designed to cooperate (LTOBC chapter 6, VM chapters 5-6¹). Thus teleosemantics is said to be "consumer semantics." It cannot be the function of a system to produce representations unless the representations that are produced have some use. But they will not have a use unless there are consumers that know how to use them, consumers such as, perhaps, some further systems in the brain or in the brains of conspecifics. But if *design* is interpreted to mean biological design and *use* is interpreted to mean biological function, then it appears that the content of a representation must depend, in the end, on its having biological utility.

Various untoward consequences have been claimed to follow from this. I will discuss some of these alleged consequences. Most of what needs to be said here has been said before one place or another, but in diverse contexts in different essays. I will try to draw these various threads together.

The first worry is sometimes raised in a broader context. Nonhuman animals, it is said, mentally represent only those aspects of the world that they need to represent in order to guide their limited repertoires of behavior. The worlds that they live in are severely restricted; they register only those aspects that are directly relevant to fulfilling their practical needs. This thought combines easily with the increasingly popular Gibsonian position that perception is always, at root, perception of affordances. The animal perceives its environment only as a series of possibilities for action, as containing things to approach or to run from, things to climb up on, places to go through, things to eat, things to hide under, things to bite or to throw and so forth. The world is perceived only in relation to the animal's own interests, needs and abilities. Animals whose needs and abilities differ must then live in different perceived worlds. Nor did Gibson restrict this description of perception to nonhuman animals. People perceive apples as for eating, mailboxes as for posting letters. But if human cognition is built on top of equipment originally designed for this kind of perception, perhaps it follows that we too live in a world with subjectively imposed limits. Our world cannot be an objective world, but is a world largely created by our peculiar human interests and abilities. The view that the content of every representation depends in an essential way on its use seems to play directly into the hands of this kind of argument. If teleological theories of content are right, we humans should be intrinsically unable to represent an objective reality. Even empirical science is

1. I use the following abbreviations: LTOBC for Language, Thought and Other Biological Categories, OCCl for On Clear and Confused Ideas, VM for Varieties of Meaning.

doomed always to present a warped and truncated view of the world.

I think it is true that basic perception is perception for action, even that it is perception of affordances (VM Part IV). Gibson's position is rightly gaining in popularity. But for reasons to be reviewed below, not all human perception is perception for action, nor does all cognition rest on perception originally designed for action. I will return to this theme soon. At the moment there are more elementary points to be made.

First, a representation of the relation of something to oneself or of the utility of something for oneself is not the same as a representation of something merely subjective. It may be, of course, that when the objects one perceives have certain kinds of relations to oneself, utilities or disutilities for oneself, then biases in observation are more likely to occur. But affairs involving relations to oneself or utilities for oneself are not, in themselves, subjective affairs. There is no intrinsic reason why an animal that perceives only affairs of practical significance to itself should not perceive these affairs perfectly objectively and perfectly accurately. For example, In order to manipulate any object in my world I will need to perceive it's spatial relation to me. But its spatial relation to me is a perfectly objective relation. Surely I am best off if I perceive it accurately.

Second, that a creature represents only a few features of its world does not mean that it represents its world as having only a few features. The limits of one's representation of the world is not a representation of the limits of one's world. That two creatures represent different aspects of the world they live in does not imply that they represent different worlds or that they represent the world as being different ways. What I know about the world is very strictly limited. It does not follow that I represent the world as having strict limits. In the vocabulary of OCCI, to suppose that this follows would be to "import completeness" (OCCI Chapter 8). The first worry then is a baseless worry.

A second kind of worry may be eased by examining more closely the notion of "biological utility" the teleosemanticist has in mind. The claim is that all human purposes may be seen to be "biological purposes" when examined in the right light. All human utility is "biological utility" (VM Chapter 1). Having biological utility is not at all the same as merely serving a purpose for which the organism's genes were selected. Besides biological purposes that rest on genic selection, such as the purposes of the stomach, heart, liver, kidneys, the purposes of their various activities, and so forth, instrumental conditioning generates a separate level of purposive activity, and explicitly represented goals implemented through practical reasoning yet another. The relations among these various levels of purpose is complicated. Let me say something about this.

One of the things that has evolved through natural selection is evolvability itself. Examples are the evolution of homeo box genes and of sexual reproduction and, more relevant to our concern here, of behavioral systems that learn by trial and error. The analogy between genic selection and operant conditioning (instrumental learning) is remarkably close (Hull et al 2001). Processes of practical

reasoning also proceed by trial and error. The thinker mentally experiments, attempting different routes from her current situation to a desired situation until a suitable path is found connecting these (VM Chapter 17). Different kinds of purposes emerge on each of these different levels of selection. These purposes sometimes conflict with one another and also with the original purposes for which the genes were selected, yet all are biological purposes, originally derived from natural selection of genetic materials (VM chapters 1 and 2).

Consider first instrumental learning. Appropriate genes are responsible for the development of the systems that learn by operant conditioning. And appropriate genes are responsible for determining what the original forms of behavioral reinforcement are for a particular animal species. But forms of reinforcement, such as alleviation of hungry or of thirsty feelings, or the presence of a sweet taste in the mouth, are not themselves means toward fulfillment of any purposes of the genes. Sweet tastes, for example, although correlated during the history of the species with the presence of needed nutrition, are not, in themselves, involved in any direct causal process resulting in increased nutrition. Behaviors reinforced by sweet tastes (M&Ms) are selected for producing sweet tastes, so they have as a natural purpose to bring in sweet tastes. Also, true, the disposition to be reinforced by sweet tastes was selected because sweet tastes typically indicated nutritive value. But behaviors can succeed in bringing in sweet tastes without succeeding in increasing nutrition. That is what saccharine is sold for. Although the purpose of procuring sweet tastes on the genetic level is gaining calories, the psychological purpose of behaviors conditioned by sweets is merely to procure sweet tastes. So behaviors can succeed in fulfilling their natural biological purposes of bringing in sweet tastes without fulfilling any more basic functions for which genes were selected. In the broad sense meant here these conditioned behaviors have "biological utility" although in a narrower sense they do not. We usually distinguish these levels of purpose by calling one "psychological" and the other "biological," but looked at carefully, the level of psychological purposes produced by reinforcement is just another layer of biological purpose, though these are not so direct as the purposes, say, of the heart's beating or the stomach's juices flowing. It is in the broader sense in which psychological purposes are included among biological purposes that the content of a representation is said to rest on its biological utility.

Processes of practical reasoning also proceed by trial and error, generating a third level of natural selection, hence of natural purposes. The natural purpose of behaviors selected through practical reasoning is to reach whatever goals are represented at the start of the reasoning as ends for which means are to be selected. The final implementing intentions that immediately generate behaviors have been selected because these representations have lead, in the inner world of the thinker, to represented fulfillments of goals. If the practical reasoning

operates properly, implementing these selected intentions will produce implementation of the goals.

An interesting and challenging question concerns the origin of these represented goals, in particular, their relation to more basic biological purposes resting more directly on genetic selection. What determines which conscious goals we will adopt? Perhaps most are derived from prior goals; we aim for them because they may help lead beyond to further goals already established. But what mechanism selected the original goals from which these were derived?

Clearly our original conscious goals are not the same as whatever our genes aim for. Babies do not come into the world fervently desiring to live a long life and produce lots more babies. Nor do they come into the world desiring experiences that will reinforce their behaviors. Babies don't come into the world with concepts, hence they don't explicitly desire anything. Suppose then an older child that has developed adequate concepts of all the things that do or will happen to reinforce her behaviors, from sweet tastes to sexual pleasure to smiles. She is able to think about each of these things. Merely developing concepts of these things is not the same, however, as conceiving these things AS things that reinforce or AS things wanted. Just as there may be a large gap between what reinforces an animal's behavior and what has deeper biological utility for the animal --between sweet tastes and nutrition or between sexual pleasure and having babies-- there may be a large gap between what actually reinforces behavior and what one wants or thinks one wants. Often we may know when we are attracted or repulsed without knowing exactly why we are attracted or repulsed, or we may know that we are happy or sad without knowing why. Knowing exactly what it is that we want is by no means automatic. Likely we only find this out by experience, indeed, by something analogous to hypothesis formation and testing. "I don't know why it is but shopping for Christmas always makes me anxious," we say, or "There is something about electric trains that just fascinates me." We may wrongly suppose that having a lot of money is what is required to make us happy, or being allowed to sleep in every day without having morning commitments. Indeed, just what it is that makes people happy has proved to be an extremely challenging question for clinical and social psychology.

Moreover, knowing what it is that attracts us or repels us need not lead to a reasoned desire for or against that thing. Often we have other conflicting interests to consider. Still, the mechanisms through which goals are projected by conscious desire and reason are undoubtedly mechanisms that our genes have been selected for building.² These mechanisms are still with us rather than having

2. The claim, made by Fodor and others, that our human cognitive mechanisms may actually have arrived of a piece without benefit of natural selection is discussed in VM, chapter 1 n.2 and chapter 2 n.5.

been selected away because they have sometimes --often enough-- produced behaviors that benefitted human genes in the past. Aims and goals that are products of these mechanisms are also biological purposes in the broad sense intended, even though they may fail very often to effect fulfillment of any more direct purposes either of the genes or of the operant conditioning systems. Fulfillment of these aims and goals still has "biological utility" in the broad sense that is meant in the context of teleosemantics.

Now one of the most important jobs of beliefs, surely, is to combine with other beliefs to form new true beliefs through inference. This kind of function contributes to biological utility whenever any of the beliefs arrived at in this way turns out to have biological utility. Even the most highly theoretical of beliefs are not excluded from having biological utility, then, so long as they participate in chains of reasoning that eventually bear practical fruit. Still, surely many beliefs that we humans have do not ever help to serve goals on any of the practical levels discussed above, so the question does arise how these beliefs can have content on the teleologist's view.

First we should be clear that the teleologist's position is not that each individual belief must be able to help serve a biological function. Rather, beliefs must fall within a general system of representation for which the semantic rules are determined. They are determined by the general patterns of response by which the consumers, interpreters, have been designed to use representations in the system and in accordance with which the producers have been designed to produce them. The obvious way in which they may have been designed to use and to make these representations would be that they or their ancestors were using representations from the same system in the past and the cooperation thus achieved helped account for the selection, through evolutionary history or through learning, of both. But there is also an alternative. There may be ways that the producers have been designed to learn or to be tuned to produce representations that are coordinated with ways the consumers are designed to be tuned to use them, so that the producer's rules and the consumer's use dispositions are somehow tailored in advance to match one another. But if the producer and consumer (or their ancestors) have a history of productive coordination through the use of a particular semantic system, we need to know how to generalize from past successful coordinations to determine a unique general semantic rule that determines content for cases where no actual coordination has historically occurred. And if producer and consumer have been designed to learn to respond in a coordinated way without actually practicing together, we certainly need an explanation of how this is accomplished. I have argued that the semantic rules governing representations that humans use in perception and thought are sometimes derived one of these ways and sometimes the other. Let me discuss them in turn.

Suppose that the rules are determined by a series of past successful coordinations between the producers and consumers of the representations. These mechanisms were selected for as a result of these coordinations, selected for either by learning systems or through genetic evolution. The semantic rules for these representations concern mapping relations between them and world affairs to which they have corresponded such that two conditions are met. First, there must be some general causal mechanism or process that operated in each of a preponderance of these historical cases, reference to which explains in each case how the producer managed to produce a representation that corresponded by these mapping rules. For it could not be a proper function of the producers to make representations that vary in a definite way parallel to affairs obtaining in the world unless they have had a systematic way of doing this under some conditions. They must, for example, be sensitive to certain "local natural signs" of the existence of these affairs (VM chapters 3-6). Second, there must be uniform explanatory causal mechanisms or processes that have accounted for this fact when past consumers' responses to the representations have contributed to proper performance of their functions, and these explanatory mechanisms must depend on the fact that the representations have corresponded to world affairs by the relevant rules.

Summarizing and setting this in a somewhat different light, representations that are false or that are not actually used or successfully used have content because their semantics is "compositional" in a very broad sense (VM, Millikan 1995). Complete representations always fall within some system of representations such that variations in the complete representations correspond systematically to variations in what is represented.³ The content of representations that are false or not used or not used productively is determined by the way other representations in the same system have been successfully used in the past and by the general mechanisms by which this was achieved historically.

But suppose someone questions that there can be only one way to generalize from a series of past successful uses so as to determinate a general rule of correspondence between representations and representeds. Recall Kripke's (1982) worries that no matter how many past examples of correct additions one begins with, these examples will never determine the correct way to go on to new examples using the "plus rule." But Kripke's problem was very different. The rule we are seeking is one that not only coincides with past

3. For a discussion of this sense of "compositional" and its application both to intentional representations and to natural signs, see VM chapters 3-4

successful cases of coordination but conformity with which, in each case, causally generated the coordination. In each case, had the representation been different the consumer would have reacted differently, and this reaction would not have served its purpose. Kripke's difficulty was that he could not appeal to dispositions that he had to react to the plus sign, because under certain conditions or at certain times his disposition might be to make mistakes. But we can appeal to dispositions. We can appeal to the dispositions that past representation consumers have had at those particular times and in those particular circumstances in which their reactions to representations served their psychological or biological functions. The particular dispositions to which we appeal are relational dispositions. How the properly functioning consumer reacts is determined as a function of its representational input. It has a disposition to react in a way that bears a certain relation to this input. Different inputs would have produced different outputs. Kripke's deep difficulty was that he could find no way of determining objectively when the attempt at addition gives a correct answer. Indeed, although he didn't mention this, he also had no way of determining which past additions were correct hence were suitable examples from which to generalize. But we do have a way of determining objectively when representation production and consumption have achieved a coordination in the past, hence from which past dispositions to generalize.

Another skeptical question is whether, on the biosemantic account, a representation could have a semantic value that was so extreme that it would be physically impossible for its consumers to make use of it? Caroline Price (2001) asks about a bee dance that indicates nectar in a position that is too distant for any bee to fly to. Bees indicate greater distance in part by slowing down their tail waggles. Price asks whether the semantic rule for the bee dance shouldn't be

The further away the nectar source is, the slower the dance should be, down to the speed that correlates with the presence of nectar at the furthest distance from which a bee laden with nectar can normally return from the hive. (p. 118)

This might be right, she says, because "...it is no part of the normal explanation for the success of the bee dance mechanism that it should sometimes produce dances that correlate with locations that are behaviorally inaccessible to the bees" (p. 119). What this overlooks is that the semantic rule for an intentional representational system is determined only by past cases of successful cooperation. Unsuccessful cases, whether real or imaginary, have nothing to do with the matter. The mapping that helps explain all the successful cases does indeed generalize beyond the bee's practical capacities. This doesn't prevent it from explaining how success was achieved within those capacities. Conformity to a semantic rule never explains success when taken alone, of course. Other

normal conditions are always required as well.⁴

Peacocke (1992) has asked about representing propositions that concern things outside our light cone. No interaction with such things is physically possible, so how could a mental representational system developed in the context of practical activities reach far enough to entertain these propositions? Indeed there is no need to leave our light cone to encounter such problems. How is it possible to think of quarks or of distant stars or of ancient historical figures or even of one's own great great grandfather if the required concepts must be developed in the context of practical activities involving these things?

Answering this question requires understanding how concepts can be developed in purely theoretical contexts, contexts of theoretical as opposed to practical inquiry. We need to understand how mental representation producers and their practically oriented consumers can become adapted or tuned to a common representational system without actually practicing together. We need to understand how production and use dispositions can be tailored in advance to fit one another, so that a portion of a representational system can have a definite semantics even though it may never have been put to practical uses. It will take me a few moments to explain how this can be. Let me first locate the problem within the framework of the theory of empirical concepts with which I have been working (LTOBC chapters 11-19, OCCI). I cannot give many details of that theory here but discussion and defense can be found in VM Chapter 19, LTOBC chapters 15-19 and OCCI chapter 7. The implied realist ontology is explained and defended in OCCI chapter 2 and in LTOBC chapters 14-17.

4. Thanks to Gunnar Björnsson for reminding me what my view is on this matter! Another discussion of essentially the same point is in (Millikan 1990). The Hoverfly is not following a rule formulated to take account of his blind spot.

Empirical concepts, in basic cases, consist in part of abilities to recognize the objects, kinds, properties and relations (I will just say entities) of which they are the concepts when these entities are encountered again in experience.⁵ Adequate abilities of this sort are, in general, very sophisticated. This is because the same entity encountered under different conditions, at different angles and distances from the perceiver or registered through different media of information transmission, will impact the perceiver through a wide variety of different proximal stimulations. The most formidable of all the tasks that the perceptual/cognitive systems must perform is to learn to recognize what is objectively the same as the same when it is encountered again under varying circumstances. Lacking this ability, an inner representation-producing mechanism will fail to recognize the presence of its represented objects nearly all of the time and will, as a result, wax ridiculously redundant, producing many separate and different representations of the very same entity and thus totally confound its consuming systems. The result will be, first, an inability to accumulate information about an entity over time in a form that is recognizably about the same entity. Second will be an inability to apply information previously gathered about entities when interacting with them again, for these entities will not be recognized as the same ones this information concerns.

Clearly, recognizing when one is encountering information about the same thing again is an essential part of having an adequate empirical concept of it. But we are not born with conceptual abilities of the required sort. How then do we learn to reidentify objects, kinds and properties correctly? The capacity to apply empirical concepts consistently is a large part of the capacity to produce those inner intentional representations that we call beliefs. Learning to reidentify empirically encountered entities correctly is a large part of learning to produce belief representations that have a definite semantics. By what means then do we distinguish successful from unsuccessful attempts at reidentification so as to fashion a nonredundant and nonequivocal inner representational system capable of representing various empirically encountered entities and the configurations among them in a uniform way?

One possibility is that correct reidentification is tested during practical activity. What counts as the same is what yields the same results when reacted to or treated in the same way. It is the same, for example, if you can chase and catch it using the same technique, eat it in the same way, it tastes just as nice and it

5. In OCCI Chapter 6 and in VM Chapter 9 I argue that gathering information by believing what another human says is in all relevant ways exactly like gathering information through direct perception. The result is that people can have basic concepts of things that they don't yet know how to recognize "in the flesh."

nourishes you the same way. This answer assumes that you can recognize when your responses or treatment of it have been objectively the same, but although attempting to stabilize two variables at once makes things more difficult, there is no reason in principle why it can't be done. No doubt this is the way in which natural selection trains the innate perceptual/cognitive mechanisms of a species and also how perceptual/cognitive learning takes place both in lower species and, at a certain level, in humans. Psychologists call this "generalization and discrimination," though it is not always recognized that part of what is being learned is to recognize what is objectively the same response relative to the practical purposes at hand.

If the only criterion for having successfully learned to reidentify an object, kind or property were success in practical activity, however, one could only learn to represent those aspects of the world needed directly to guide one's behaviors. Perhaps the representational abilities of nonhuman animals are limited in exactly this way (VM chapters 18-19). But there seems reason to believe that human cognitive capacities are not so limited. Is there a way that we humans might learn to reidentify objective entities we have had no practical dealings with, so as to accumulate information involving them in advance of practical uses? A general ability to discover where objective distal samenesses lie beneath the diversity of proximal stimulations without having to resort to risky trial and error in overt behavior would surely have an evolutionary advantage. But it would not be necessary then that every conceptual ability developed should actually find practical applications. Belief representations expressing concepts developed in this way might have determinate truth conditions prior to any applications to practice.

The proposal I have made might be summed in old fashioned terms by saying that coherence in human belief serves as a test of correspondence (LTOBC chapters 18 and 19, OCCI chapter 7, VM chapter 19). Coherence serves as a test of consistent correspondence between representational elements and corresponding elements in objective world affairs. It serves as a test of our capacities correctly to reidentify distal entities through diverse proximal stimulations. Consistent judgment is a strong indication of the representation producer's capacity to represent the same as the same. Coherence is a psychological goal that reinforces ways that the cognitive systems are producing representations. Like a sweet taste in the mouth, coherence is a sign that has correlated with achievement of a deeper biological purpose, the production of a consistent and accurate representational system. I will say more about this.

Whenever we have opportunity to gather the same information in two different ways, through two different information channels, by interpreting different sets of proximal stimulations, we gain evidence that our methods of identifying the entities represented in the subjects and the predicates of our

judgments are converging to focus on objective entities. Consistent agreement in judgments is evidence that our various methods of making the same judgment are all converging on the same distal affair, bouncing off the same target, as it were. If the same belief is confirmed by sight from many angles in different lights, by touch, by hearing, by testimony, by inductions one makes, this is sterling evidence for the accuracy of the various methods one has used to identify each facet of the world that the belief concerns. If the belief is confirmed also by theoretical considerations, by using inference in the process of identifying a truth, that is further evidence of the same kind. The object that is square as perceived from here should be square as perceived from there and square by feel and square by checking with a carpenter's square and square by measuring its diagonals and square by hearing from another person that it is square.⁶ Similarly, if a person is tall and good at mathematics as recognized today, that same person should prove tall and good at mathematics when reidentified tomorrow. Both one's general methods of reidentifying individuals and one's methods of recognizing height and mathematical skill are corroborated in this way as methods or reidentifying objective selfsames. That the same chemical substance is found to melt at the same temperature by checking with an alcohol thermometer, a mercury thermometer, a resistance thermometer, a gas thermometer, a thermel and a bimetal expansion thermometer is evidence both that one is able to recognize the same chemical substance again and that there is indeed some real quantity (unlike caloric pressure) that is being measured by all of these instruments. In general, if many different operational definitions correlate well with one another, then they are probably all measuring the same thing. More fundamental, there is probably something real that they are measuring.⁷

Consistency within a representational system can be used as a test for recognition of objective identities, of course, only if inconsistency is possible as well --indeed, only if inconsistency can show up right on the surface of the representational system. Consider bee dances, for example. If two bees dance different dances when returning to the hive, these dances can't contradict one

6. See footnote #5 just above.

7. "If we see on a road one house nearer to us than another, our other senses will bear out the view that it is nearer; for example, it will be reached sooner if we walk along the road. Other people will agree that the house which looks nearer to us it is nearer; the ordinance map will take the same view...." (Russell, The Problems of Philosophy, p. 31) This is Russell's argument that a real spatial relation between the houses corresponds to the nearer than relation of which we are aware between certain sense data.

another, for it is always possible that there is nectar both places. Nor do the bees have a way of representing where there isn't any nectar. Bee dances are not sensitive to a negation transformation. A subject-predicate sentence, on the other hand, is explicitly incompatible with its contradictory. The incompatibility shows right on the surface. Similarly, humans can think negative thoughts, and these thoughts contrast explicitly with possible positive thoughts. Whether the way human thoughts are coded resembles the way language is coded in other ways, certainly our thoughts are sensitive to an explicit negation transformation. Explicit disagreement in judgments is possible because explicit negation is possible.

We should consider, then, how evidence for negative judgments is gathered. Notice that absence of perceptual evidence that would lead one to form or confirm a belief is not evidence for the negative of that belief. If you look again from another angle at what you took to be a square object but fail this time to see that the object is square, or reach out with your hand but fail to feel that the object is square, this by itself is not evidence that the object is not square. Perhaps the trouble is that you can no longer see the object, or that although you see it, you can't make out its shape against the light. Perhaps the trouble is that the object is not where it appeared to be so that reaching out your hand to feel it you encounter nothing at all. To gather evidence against the object being square, you must first see or feel the object, and then you must see or feel that its shape is some contrary of square, perhaps round or oblong. Gathering evidence for the negative of a proposition is always gathering some kind of positive evidence, evidence for some contrary of that proposition.⁸ At the most fundamental level, gathering evidence for the negations of propositions requires abilities to recognize contraries of properties through the variety of their diverse manifestations and to recognize them as being contraries, as being incompatible.

8. In its basic form, negation is "internal," a semantic operation on the logical predicate of a sentence (LTOBC Chapter 14, Horn 1989, Chapter 6). There are also secondary uses of "not" to reject a sentence on non-truth-conditional grounds, as in "The slithy toves did not gyre and gimbal in the wabe" or "The square root of two is not blue" or "You didn't see two mongeese, dear, you saw two mongooses" or "The king of France is not bald, dear; France doesn't have a king." These are external negations. External negation is called "immunizing" negation in (Millikan 1984). Horn (1989) gives a parallel analysis calling it "metalinguistic" negation as opposed to "descriptive" negation. The idea is that external negation is not a semantic operator. The fundamental use of the negative is not to prohibit assertion of a sentence, but to make a positive, though indefinite, statement to the contrary.

These abilities are required in order to test one's grasp of the identities of subjects of judgment, and vice versa. The result is not an epistemological regress or circle. But both of these kinds of abilities do have to be in place before stability of judgment over time, over various perspectives and through diverse media of information transmission can emerge with regard to particular subject matters. Both these abilities have to be in place before steady evidence can accumulate that successful identifications are being made outside the context of practical activity.

True, without doubt the first leg up is still practical. Many of the things recognized as the same again for purposes of practical use turn out to correspond to pretty good subjects or predicates for theoretical judgment as well. (The second leg up is public language --OCCI chapter 6, VM, chapters 9 and 19.) But the end result is the perfection of concepts by a method that does not rely on practical uses as its criterion of success. And yet this criterion has been selected for because in the past its use has, often enough, ended by yielding practical results. Beliefs about things outside our light cone, then, are like desires for candies when these candies are sweet because they contain saccharine. Their content is determined biologically, but the biological functions --obtaining logically coherent thought in the one case, obtaining sweet tastes in the other-- that determine their content are not on the same level as any direct purposes of the genes.

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