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Reading Problems: Literacy and the Dynamics of Thought

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Abstract: In this article, we address the problem of predication, or the problem of connecting conceptual predicates to the sets of properties and attributes that correspond to these predicates. We take as our starting point Mark Wilson’s work, especially “Predicate meets Property,” and add to it a metaphysics of problems that one finds in the work of Gilles Deleuze. This enables us to understand the relationship between a predicate and the set of properties in terms of the relationship between a solution to a problem. The advantage of this approach is that it helps to illuminate the key issues involved in contemporary work on human reasoning. We sketch some of these advantages by looking to recent work on literacy and how literacy affects the capacity to engage in formal reasoning.

Keywords: predication, human reasoning, literacy, metaphysics of indeterminacy, Deleuze

This essay will take as its starting point Mark Wilson’s claim that human beings are ‘hydrocarbon detection devices,’1 or ‘self-correcting measurement devices with memories’ as he also puts it.2 In particular, this essay will explore the processes that occur as a predicate meets a property, to borrow a phrase from Wilson’s essay of the same name. Stated differently, the guiding problem for this essay is to begin to sketch and understand the processes involved as a conceptual category or predicate comes to be tied and connected to a perceived property or set of properties. Unpacking the implications of this problem will allow us to establish fruitful connections between Wilson’s project and Deleuze’s metaphysics. This in turn will add to the understanding of how literacy affects human reasoning and consciousness. More precisely, the discussion of literacy will be used as a basis for sketching a Deleuzian theory of reasoning that extends Wilson’s arguments but adds a theory of problems that provides a metaphysical basis for Wilson’s arguments as well as for recent work on the study of reasoning and cognitive science such as is found in the work Daniel Kahneman, Keith Stenning and Michiel van Lambalgen, among others.

1 Predication

Let us begin with the example Wilson uses to set the stage for the arguments in his essay, “Predicate meets Property”:

I saw a movie (Island of Lost Women) in which a colony of Druids drifted in ancient times to a South Sea island, where they were subsequently terrorized by cavemen and out-takes from One Million B.C. Their descendants, naturally, were able to speak a variety of English, albeit with miscellaneous archaic features. A B-52 full of regular American types landed on their uncharted island and the Druids exclaimed, “Lo, a great silver bird falleth from the sky.”3

1 Wilson, “Predicate Meets Property,” 579.
2 Ibid., 576.
3 Ibid., 549.

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We may find this example humorous, and perhaps chuckle at the naiveté with which the Druids categorize a plane as a bird. At the same time, the mistake makes perfect sense if we think of the predicate, ‘is a bird’, as something that applies to a set of physical attributes and properties that include such things as having wings, flying in the sky, descending and landing, etc. The circumstances could have been very different, however, and a very different predicate could have been applied. Suppose, Wilson argues, ‘the hapless visitors [in the movie] had crashed in the jungle unseen and were discovered by the Druids six months later as they camped discontentedly around the bomber’s hulk, their Druid rescuers would have proclaimed, “Lo, a great silver house lieth in the jungle.”’

Do these Druids suffer from conceptual confusion, or do they think about the world differently (that is, have a different conceptual scheme)? Wilson argues that they do not, and the arguments he puts forth to justify this claim both challenge and extend a standard Fregean-Russellian understanding of concepts—most notably, Frege’s claim that ‘it must be determinate for every object whether it falls under a concept or not; a concept word which does not meet this requirement on its Bedeutung [reference] is bedeutungslos [meaningless].’ What Wilson hopes to show by way of his example is that while from an outsider’s perspective there appears to be conceptual confusion going on in that the Druids place an object under a concept to which it does not belong, the Druids themselves, Wilson surmises, do not have the sense of being confused, or of placing an object under a concept to which it does not belong.

Wilson need not rely on campy movies, however, for examples of the process that interests him. In his voyages through the south seas, Captain Cook encountered a number of islanders who had never seen the animals or many of the other things Cook had brought with him aboard his ships. In one memorable anecdote, recounted by Dugald Stewart, the native islanders were found to be rather flexible in their application of predicates. As Stewart recounts Cook’s story,

“The inhabitants,” says he [Captain Cook], “were afraid to come near our cows and horses, nor did they form the least conception of their nature. But the sheep and goats did not surpass the limits of their ideas; for they gave us to understand that they knew them to be birds ... [and the explanation offered by Stewart for this seeming ‘mistake’] But these people seemed to know nothing of the existence of any other land animals, besides hogs, dogs, and birds. Our sheep and goats, they could see, were very different creatures from the two first, and therefore they inferred that they must belong to the latter class, in which they knew that there is a considerable variety of species.”

As with Wilson’s example of the Druids, a predicate, ‘is a bird,’ is applied to objects to which we, as objective observers, know they do not apply. But there is a critical difference. Whereas one can understand, on Wilson’s account, the extension of the predicate bird to the plane because they each share some similar attributes, in the case of the islanders, on Stewart’s account, it is not a set of similar attributes but rather the known fact that there is ‘a considerable variety of species of birds,’ and thus by process of elimination they thought of sheep and goats as birds. The cows and horses surpassed the limits of their ideas and thus they could not ‘form the least conception of their nature.’ For cows and horses, therefore, the differences were too great to be accommodated by the known variety of birds – birds are not that varied! The problem this leaves us with, then, is to explain the process whereby a predicate term comes to be applied and tied to a given set of attributes and properties. On the Fregean-Russellian account that Wilson seeks to extend and modify, when one grasps the sense of a concept one has in essence understood a rule that guides one’s actions and leads them to connect a predicate to those objects that fall under the concept. When my wife tells me to go water the gardenias in our back yard, I may go and water all the bushes since I do not possess the rule whereby I could, with confidence, point to what does or does not belong under the concept gardenia. I thus water everything just to make sure. For Wilson, by contrast, what allows us to connect a predicate to a set of attributes is not the sense, as it is for Frege, or universal for Russell, but rather we ‘should employ physical properties rather than concepts as the appropriate middle terms.’

4 Ibid., 550.
5 The Frege Reader, 178.
6 Stewart, Elements, 153.
7 Wilson, “Predicate Meets Property,” 559.
To state in Humean terms Wilson’s point that it is a physical property rather than sense that connects a predicate to a set of attributes, we could say that what is going on in the case of the Druids is that a physical property triggers an associative resemblance whereby the predicate bird gets applied to those objects associated with the relevant set of properties that is triggered by the physical property. Upon seeing the B-52 in the sky, the physical property ‘winged object in the sky’ let’s say, is sufficiently similar to previous experiences of other winged objects in the sky to prompt what Don Garrett, in reference to Hume’s theory of abstract ideas, has called a ‘revival set’ whereby a set of other related properties associated with birds comes by habit to be connected to that which triggered the revival set. The Druids thus come by habit to identify the B-52 as being a bird. The example of the islanders Cook encountered, however, is more problematic. As we saw, it was not the similarity of a physical property between sheep and goats and what the islanders had already come to identify as birds which mattered, but rather it was the fact that birds were known to encompass a ‘considerable variety’ that led them to connect, by process of elimination, the predicate bird to sheep and goats. The horses and cows aboard Cook’s ships, however, were too different to be categorized as birds, and thus with this example the problem becomes clearer and forces us to look under the hood and begin to discern the processes that generate the habits and revival sets that connect predicates to properties. It is to this that we now turn.

2 Problem of taste

In detailing to how the ties between physical properties and predicates get forged, I will argue that a set of attributes and properties needs to be constructed in such a way that a tie to a predicate becomes possible. In extending Deleuze’s arguments, I will call such a set that has been constructed but has not yet been tied to a predicate, or to a rule, a problem. In *Difference and Repetition*, for example, Deleuze offers the example of a monkey who discovers that food is under colored boxes. Suddenly the boxes become relevant to the concerns of the monkey and they then begin to pick up boxes at random. As the experiment progresses, Deleuze notes, ‘there comes a paradoxical period during which the number of “errors” diminishes even though the monkey does not yet possess the “knowledge” or “truth” of a solution in each case…’8 This space where the monkey is in relation to a relevant set of elements, the colored boxes, but does not yet possess the knowledge or rule that would determine which boxes do and do not contain the food, is precisely the problem space that allows for the possibility of rules (or concepts and predicates). In this section we will begin to clarify the nature of these problem sets.

Let us begin with a rather mundane example – coffee tasters. In an essay from his collection of ethnomethodological studies, Kenneth Liberman examines in intimate detail the processes a coffee taster goes through to ensure that a coffee that is tasted at a receiving wharf is associated with the same predicate that was used at the shipping wharf – e.g. “chocolate,” “floral,” etc. In his analysis, Liberman draws heavily upon the distinction between two senses of objectivity. As he describes these two senses,

The relationship between these two senses of objectivity, Liberman argues, is reciprocal. For instance, during a tasting Liberman, an admitted novice at coffee tasting, decided that a particular coffee was ‘fruity.’ Another taster corrected him, saying the proper term is ‘floral.’ In response to this correction, Liberman ‘re-tasted the coffee and at once recognized the greater accuracy of this descriptor. Taste descriptors not only describe the taste that they find, they find the tastes that they describe.’10 The objectivity in the first sense, the physical tasting of actually existing coffee was, in this context, a problematic set of attributes –

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8 Deleuze, *Difference and Repetition*, 164.
10 Ibid., 221.
the smell, varied tastes, etc. – without a clear rule or concept to apply to this set. When ‘fruity’ was replaced by ‘floral,’ Liberman discovered a better way to connect the varied elements of the set. Such efforts to connect the varied elements to a predicate are always provisional, Liberman argues, for he argues that to which predicates are being applied, in this case the taste of coffee, forever ‘evades the system of descriptors that attempts to lasso it into a preexisting, comprehensive system of identity: the taste is ultimately a non-identity in that it always and necessarily exceeds whatever one identifies.’ Liberman refers to this necessary excess of taste that eludes definitive description and detection as resistance, and he claims that coffee tasters, ‘to be professional…must give this resistance its due; however, as soon as they do so the coherency of the system (for example, the tasting schedule used to measure the flavors) is put in jeopardy.’ In other words, if a taster gives in too much to the resistance of taste to definitive description, then this threatens to undermine the usefulness of the tasting schedule whereby a coffee taster in Rio de Janeiro agrees with one in New York that a particular coffee has a strong floral character. The resistance of taste is still there, however, and this becomes evident in actual practice as coffee tasters work collaboratively around a table and ‘it may take time,’ Liberman notes, ‘for a group of tasters to bring their practice of applying a tasting schedule into harmony on any local occasion, but they generally can get their use of descriptors remarkably well coordinated in less than a day.’ At times, however, a taste may continue to resist being described, or it ‘resists being said…resists being organized into their discourse,’ as Liberman puts it, and it is at times like these ‘where they [the coffee tasters] focus their attention.’ What the coffee tasters encounter at such times of resistance is precisely the problematic space that makes it possible to attach a descriptor or predicate. Coffee tasters will point to such problematic encounters with taste, what Liberman refers to as aporia, as integral to learning about coffee: ‘At the point of one aporia, when the taste of coffee could not be determined in a sufficiently objective way, a taster whispered to me, “This is where I learn the most about coffee taste.”’

Drawing from the case of coffee tasting may at first appear to be too idiosyncratic an example to generalize from, but one can find a very similar process at work in numerous examples throughout Mark Wilson’s work, especially in his magisterial book *Wandering Significance* but also in his essay “Predicate Meets Property.” Take the case of temperature. Most people assume that temperature, unlike the ‘floral’ character of coffee for example, is a physical attribute that should be capable of being detected and measured objectively; namely, with a thermometer. As Wilson shows however, and as has especially been shown in Hasok Chang’s book *Inventing Temperature*, the process whereby temperature has come to be detected through objective means met repeated resistance (in Lieberman’s sense of that term) all along the way. The very standardization of temperature readings itself was riddled with difficulties. As Chang shows, one of the first steps in standardizing temperature entailed establishing fixed points that provide the stable parameters from which a scale of temperature readings can be constructed. The obvious candidates for such fixed points were the temperatures at which water boils and freezes. For many different reasons, there was tremendous debate about whether such a fixed point as the temperature at which water boils even exists. Under conditions where as much dissolved oxygen as possible had been removed from the water then it would boil at temperatures well above 100 degrees centigrade, in a phenomenon known as superheating. Scientists did in time converge upon the fixed points that we now take for granted. Chang’s conclusion is thus much like Lieberman’s: just as coffee tasters, in response to the resistance of taste to definitive descriptors, work together and ‘cooperatively build up certain unities of meaning,’ Chang likewise defends a coherentism that accounts for the reality of temperature not in terms of any objective foundations that would definitively ground this reality but rather in the convergence of work and experimentation that continually comes back to the same result as scientists and researchers cooperatively ‘build up certain

11 Ibid., 223.
12 Ibid., 224.
13 Ibid., 223.
14 Ibid., 248.
15 Ibid., 247.
unities of meaning.’

Chang’s conclusions are very much in line with Wilson’s. If temperature, for instance, is taken to be equivalent to mean kinetic energy, then Wilson cautions that this is only true of a classical ideal gas at equilibrium but not with most other substances or in dynamic contexts. If we assume a thermometer measures temperature, we also need to overlook the fact that this is true only within certain limits and parameters. A mercury thermometer, Wilson points out, ‘will not function properly in an environment full of shock waves or if applied to objects at extremely high or low temperatures.’ It is for this reason that Wilson argues that ‘Except in trivial cases, almost no universal detection devices exist; instruments which can detect the presence or absence of P in any object whatsoever in any context.’ In the vein of coherentism Chang argues for, Wilson will likewise argue that what gives us a basis for claiming there is a set of real physical properties associated with the predicate temperature is that there is a convergence of operational and experimental results. It is only because ‘we obtain approximately similar readings from such a wide variety of distinct devices, for example, gas thermometers, liquid in glass thermometers, thermocouples, so called “sonic” thermometers, etc.’ that enables us to refer to the physical properties associated with temperature as being freed from their ‘operational underpinnings.’ For Wilson the problem is not that we simply have not managed to create a detection device capable of taking into consideration all possible variables and parameters; rather, and in a conclusion that mirrors Lieberman’s claim that taste resists the coffee taster, reality resists the descriptive frameworks we use to lasso it. This is in fact the thesis of Wilson’s Wandering Significance, which he states as follows:

The main consideration that drives the argument of the book is the thesis that the often quirky behaviors of ordinary descriptive predicates derive, not merely from controllable human inattention or carelessness, but from a basic unwillingness of the physical universe to sit still while we frame its descriptive picture.

To restate Wilson’s thesis in the terms I have used here, our attempts to establish a clear, determinate link between a predicate and a set of physical properties forever encounters the problematic space that both undermines such attempts and is the condition for the possibility of creating the links between predicates and properties. To clarify how problems allow for the possibility of tying predicates to a set of properties and attributes, we can return to the work of Deleuze and then to the problem of literacy.

3 Determinables

To set the stage for a better understanding of Deleuze’s metaphysics of problems, I want first to borrow a distinction that Jessica Wilson draws upon heavily in her efforts to develop a naturalist theory that is not reducible to physical terms alone, what she calls non-reductive physicalism. This is the distinction between determinable and determinate. For instance, the color red is a determinable and fire engine red, scarlet, crimson, etc., are the determinate ways in which red instantiates the determinable. If Sophie the pigeon, to use Jessica Wilson’s example, has been ‘trained to peck at any red patch,’ then if she is presented with a red patch she will peck, including a scarlet patch, since it too is a determinate way of being red. If Sophie’s cousin, Alice, however, has only been trained to peck at scarlet patches then she will not peck at a different shade of red such as burgundy while Sophie will peck at the burgundy patch. The conclusion Wilson draws from examples such as this is that ‘the determinable type red has fewer powers than its determinate types.” In other words, for Wilson since the powers associated with pecking at red are nothing over and above the powers associated with pecking at any determinate shade of red, then the powers of
the determinable red are nothing other than the powers of a subset of the powers of the determinate types. Wilson is clear on this point: ‘since broadly scientific determinables are associated with distinctive sets of powers, and are typically “multiply determinable,”’ the powers of determinable types will typically be a proper subset of those of their determinate types.23 One pigeon trained to peck at red may, for instance, not peck at a red that shades ambiguously off into orange or purple, and thus the subset of determinate powers may not include this shade whereas for another pigeon similarly trained it may well peck at this shade. Wilson does not refer to such examples but given her acceptance of a metaphysics of indeterminacy24 and her claim that determinables are “multiply determinable,” or “multiply realizable”25 as she also puts it, it seems clear such examples are in line with her approach.

We can gain added insight on this distinction between determinable and determinate powers by turning to Deleuze. In an example from Difference and Repetition that adds further detail to the examples found in Jessica Wilson’s essays, Deleuze discusses the processes whereby phenomenon of thirst exemplifies the transition from a passive to an active synthesis. Passive synthesis is a concept Deleuze develops in extending his work on Hume (as I have argued elsewhere), and it can also be seen as sympathetic to Jessica Wilson’s non-reductive naturalism. In introducing the concept, Deleuze notes that for Hume the repetition of the same sequence, AB, AB, AB, does not produce anything different in the elements themselves but rather it is the mind that produces something new through the contemplation of the feeling of compulsion that comes with the formation of a habit. As Deleuze puts it, ‘Repetition changes nothing in the object repeated, but does change something in the mind which contemplates it.’26 The formation of a habit is a passive synthesis, and it is the contemplation this habit makes possible that can bring about a new idea. It is in this context where Deleuze brings in the example of thirst. If we take the mental state of thirst, or the state whereby an animal actively seeks water as a means to satisfy its thirst, then for Deleuze, stated in Jessica Wilson’s terms, this mental state of thirst is nothing over and above the determinate powers of the body that detect the absence and presence of water and cause the organism to seek water when thirsty. The actually determinate powers at work, however, are only a subset of the determinable mental state of thirst. The determinable state of thirst is multiply realizable, or sufficiently general, in that it can be actualized by an indeterminate number of subsets of determinate powers. We can clarify this point further by way of yet another well-known example—namely, Jakob von Uexküll’s ticks. As Uexküll shows (in an example Deleuze highlights as well), the tick has three determinate powers—it can detect light, which it uses to climb to perches from which to jump on mammals; it detects butyric acid which is emitted by all mammals; and it detects the warmth associated with mammals which then prompts the tick to begin sucking blood from the mammal. These three determinate powers give rise, through contemplation in Deleuze’s sense of the term, to the determinable type of behavior associated with the tick. This determinable behavior, however, is multiply realizable in that the actual circumstances in which the tick finds itself, the type of mammal that passes by, etc., will vary from circumstance to circumstance. This is also true of the determinate behaviors, for they too are habits that result from repetition, the repetition of butyric acid that becomes the determinable behavior of jumping onto the source of the odor. This behavior, as a determinable, is also multiply realizable in that the actual, determinate circumstances that prompt the behavior will vary. The determinable type, or what Deleuze will refer to as Idea, is the result of a contemplation of elements, such as the repetition of butyric acid, etc., that allows for the genesis of a generality irreducible to the determinate powers themselves while yet being nothing over and above these powers. For this reason Deleuze concludes that ‘habit draws something new from repetition – namely, difference (in the first instance understood as generality).27

23 Ibid.
24 See Wilson, “Metaphysics of Indeterminacy.”
25 See Wilson, “Non-reductive Realization and the Powers-based Subset Strategy,” 131: ‘But in cases of multiple realizability, a functionally realized state arguably has only a proper subset of the token powers of its realizing state...when a functionally characterized feature is multiply realizable, its realizing types will each have all the powers associated with the functional, role, and more besides. Hence the powers of the realized type will be a proper subset of those of each of its realizing types.’
26 Deleuze, Difference and Repetition, 70.
27 Ibid., 73.
It is important at this point, however, to highlight a crucial difference between Deleuze’s project and the use to which Wilson puts the determinable/determinate distinction. Most significantly, for Deleuze a problem space, as discussed earlier, needs to be constructed, and constructed in a way that allows for the emergence of a predicate that is then tied to the set of properties associated with the problem space. For Wilson, by contrast, determinables are fundamental, and if they are created at all, it would be by God, as Wilson acknowledges in the closing line to her essay “Fundamental Determinables”: ‘Going forward, it may be useful to keep in mind the basic picture of what God had to do to create a world, if what I have here argued is correct: at a minimum, God had to bring into being the determined fundamental determinables.’

The same is largely the case with respect to the behaviors of a tick or the mental state of thirst; in both cases we have an already established habit or instinct. In short, with these examples we have an already presupposed link that ties the determinable to its various subsets of determinate powers, or the subset of determinate behaviors that are behaviors of the tick, etc. A problem space, however, as defined earlier, is precisely the set of elements that are lacking a tie to a rule or a determinable. It is the construction of this problem space that interests Deleuze, and once constructed it is what allows for the possibility of a rule that would then subordinate the elements of the set to being simply instances of a rule, or it is the tie that connects a predicate to a set of properties. To clarify the manner in which a determinable is constructed from a set of determinate elements, or how a problem space is constructed, I will take literacy as my starting point.

4 Literacy/orality

In the classic studies of how literacy affects the manner in which one thinks about the world, there are a number of important parallels with the themes that have been the subject of this essay. First, and most importantly, the acquisition of reading skills has been seen as integral to the ability to relate, to continue with the discussion of the previous section, a determinable to its determinate instances, an abstract predicate or category to its instantiations. In his famous study of the illiterate villagers in remote Uzbekistan and Kirghizia, Aleksandr Luria found that the villagers would not categorize the world in the same way their literate counterparts would. For instance, when shown pictures of a hammer, saw, log, and hatchet, and asked which three of the four can be grouped together, hence excluding one, an illiterate peasant from the village of Yardan said “They all fit here! The saw has to saw the log, the hammer has to hammer it, and the hatchet has to chop it ... You can't take any of these things away.” A similar result occurred when Luria asked different groups of people to group a variety of different colors together into five distinct groups and in accordance with their ‘appropriate categorical names.’ Those with some formal education were readily able to do so, but a group of illiterate Ichkari women found the task impossible. As Luria reported the results, the task itself ‘created complete confusion and called forth responses such as, “It can't be done,” “None of them are the same, you can't put them together,” “They're not at all alike,” or “This is like calf's dung, and this is like a peach.” As far as the Ichkari women were concerned, there are only determinate colors that are ‘not at all alike,’ and the problem of grouping them together as determinate instances of a determinable color (e.g., red) is not even a problem but an impossibility for them. Solving reasoning problems were equally difficult for his subjects, Luria found. When given the following syllogism—“In the Far North, where there is snow, all bears are white. Novaya Zemlya is in the Far North. What color are bears there?”—a typical response was either to refuse to make any inferences at all or add qualifiers such as pointing out that ‘they “had never been in the North and had never seen bears; to answer the question you would have to ask people who had been there and seen them.” The conclusion Luria draws from this and other examples along these lines is that ‘the formal operation of problem-solving presents...
major, sometimes insurmountable difficulties for these subjects."\textsuperscript{33} What Luria claims is happening with his illiterate subjects is that since "their thought processes operate on the level of graphic and functional practical experience."\textsuperscript{34} Rather than at the level of thought mediated by the use of abstract categories and concepts one acquires as they learn to read, they are unable to think of determinate instances as instances of a determinable category.

Recent researchers have come to find that Luria's conclusions are too extreme and they have since modified their accounts of his findings. What is stressed in this new account is the fact that Luria's subjects are being placed in an unfamiliar situation, not unlike the situation the Druids or islanders were in. Rather than being unfamiliar with planes, sheep, and goats, however, Sylvia Scribner for instance argues that they are unfamiliar with the use of "verbal logic problems (along with other "formal problems") [which constitutes] a specialized language genre that stands apart from other genres in ways that may be difficult to define but are readily recognizable."\textsuperscript{35} Rather than simply thinking in a 'graphic-functional' manner as Luria supposes, Scribner argues that Luria's subjects are unfamiliar with the closed nature of the formal language genre and as a result set out to create a new set of relations from which a conclusion can be drawn. In particular, subjects import empirical evidence into formal problems in order to address it. For example, when the problem is:

\begin{quote}
All people who own houses pay a house tax.
Boima does not pay a house tax
Does Boima own a house?
\end{quote}

Those with more familiarity with the language of formal problems will generally provide a theoretical justification such as "If you say Boima does not pay a house tax, he cannot own a house," while those less familiar with the genre will provide an empirical justification: "Boima does not have money to pay a house tax."\textsuperscript{36} For Scribner, with "the majority of traditional adults, empirical bias entered the problem solution process primarily as selector and editor of the "evidence"."\textsuperscript{37} In other words, for those unfamiliar with the genre of formal verbal problems, or who find the genre irrelevant to the current situation, the task of problem solving becomes one of selecting the relevant empirical evidence with respect to the problem. Keith Stenning and Michiel van Lambalgen have recently extended Scribner's claim and have argued that cognitive science and the study of reasoning needs to take semantics into consideration for, as they put it, "meaning is often not given but constructed."\textsuperscript{38} They then set out to understand reasoning as a two stage process: 'first one has to establish the domain about which one reasons and its formal properties (what we will call reasoning to an interpretation) and only after this initial step has been taken can one's reasoning be guided by formal laws (what we will call reasoning from an interpretation)."\textsuperscript{39} When Scribner argues, contrary to Luria, that 'traditional people can and do engage in valid deductive reasoning on verbal logic problems,' and accounts for the differences Luria observed as being a matter of having to 'put brackets around what they know to be true."\textsuperscript{40} Scribner is implicitly recognizing, on Stenning and Lambalgen's account, the first stage whereby they reason to an interpretation in terms of what is taken to be relevant to

\textsuperscript{33} Ibid., 132.
\textsuperscript{34} Ibid.
\textsuperscript{35} Scribner, "Modes of Thinking and Ways of Speaking," 498.
\textsuperscript{36} Ibid., 489.
\textsuperscript{37} Ibid., 491.
\textsuperscript{38} Stenning and Lambalgen, Human Reasoning and Cognitive Science, 19.
\textsuperscript{39} Ibid., 20.
\textsuperscript{40} Scribner, "Modes of Thinking," 494.
the situation. Those with complete unawareness of formal reasoning and its closed-world assumptions,\textsuperscript{41} meaning one need not look beyond the premises themselves in order to correctly infer the conclusion, then empirical evidence, or the graphic-functional details for Luria, will be what is relevant. One may, however, recognize the approach of formal, closed-world reasoning but simply find it to be irrelevant. This attitude was strikingly obvious to Joseph Glick during tests of illiterate Kpelle tribesmen. When attempting to get them to group objects in accordance with the abstract categories of food and tools, the tribesmen would instead group the potato with the hoe, the orange with the knife, etc. Out of curiosity, Glick asked them “how a fool would do it?”\textsuperscript{42} and they promptly grouped the food together and the tools together. In short, familiarity with the genre of formal, abstract language problems is not necessary and sufficient for its use; it must also be seen as relevant, and for the particular Kpelle tribesman Glick encountered it was only relevant for fools.

5 Metaphysics of problems

Let us now take the implications of what we have discussed with respect to literacy and determinables and return to the theme with which we began—that is, the tying of a predicate to a set of physical properties. As was argued for earlier, a problem in the Deleuzian sense of the term can be defined as a set of elements or properties that is not yet tied to the predicate or rule that would then make these elements determinate elements of a determinable, or tokens of a type. In contrast to Jessica Wilson’s argument that a determinable is fundamental, for Deleuze problems are fundamental and are the conditions for the emergence of determinables and the relationship between a determinable and its subset of determinate instances. Problems, however, need to be constructed, or, as Deleuze makes quite clear, they can only be posed after the set of elements has been constructed in such a way that makes it possible for the problem to be posed: ‘Planes must be constructed and problems posed, just as concepts must be created.’\textsuperscript{43} For example, the plane of elements associated with driving a stick shift car (stick shift, brake, clutch, accelerator, slope of road, etc.) or the monkey finding food under the box of a particular color (all the different colored boxes, food, hunger, etc.) must be brought into a relationship whereby a problem is posed and the task of connecting the elements becomes clear. Another way of stating the point is to say that constructing the plane so it is possible for a problem to be posed involves making sense of the elements, in the literal sense of making, and then the problem and its solution become possible a.\textsuperscript{44}

We can gain a clearer sense of what making sense entails, and how a problem is related to a solution, if we return to our earlier examples from Mark Wilson and Hasok Chang. In establishing the thermometric scale we use today, a number of different approaches slowly converged upon a set, fixed point, and yet what is often loss or concealed (to use Deleuze’s term) is the variety of approaches that eventually made sense of what temperature is, a temperature that is irreducible to any one of the particular approaches that went into its construction. In fact, perhaps the central project of Chang’s book is to justify the claim that ‘Many results of science that we readily believe are in fact quite extraordinary claims …[and] Nowhere is this situation more striking than in our scientific knowledge of heat…’\textsuperscript{45} The case was similar for Mark Wilson. Although

\textsuperscript{41} Stenning and Lambalgen bring this concept in to account for the differences observed by Luria between literate and illiterate villagers. The reason Kpelle villagers have difficulty answering formal problems such as – All Kpelle men are rice farmers. Mr. Smith is not a rice farmer. Is Mr. Smith a Kpelle man? – is because they do not apply ‘closed-world reasoning to Mr. Smith’ (Stenning and Lambalgen, Human Reasoning and Cognitive Science, 37). In other words, they look beyond what is given in the problem itself to other factors that may be relevant, factors that are bracketed, as Scribner said, when one uses closed-world reasoning.

\textsuperscript{42} See Glick, “Cognitive Development in Cross-Cultural Perspective,” 635.

\textsuperscript{43} Deleuze and Guattari, What is Philosophy?, 25.

\textsuperscript{44} See Deleuze, Difference and Repetition, 54: ‘Even if the problem is concealed by its solution, it subsists nonetheless in the Idea which relates it to its condition and organizes the genesis of the solutions. Without this idea, the solution would have no sense.’ In this context, Ideas, and this is indeed intended to have a Platonic implication, are problems. Deleuze states this point explicitly: ‘problems are Ideas’ (Ibid., 168).

\textsuperscript{45} Chang, Inventing Temperature, 3-4.
we take temperature for granted and assume we know what we are talking about, what is often if not almost always lost is awareness of the fact that temperature only makes sense within a variety of multiple contexts and with differing parameters taken into consideration. The typical mercury thermometer, recall, ‘will not function properly in an environment full of shock waves or if applied to objects at extremely high or low temperatures.’46 Most people, Wilson concedes, will be satisfied with ‘making claims like ‘this thermometer measures temperature’” and thus the practical considerations actually involved with measuring temperature in a wide variety of contexts and circumstances tend to get lost and “in practice apparently objective property indices may drift into becoming “concept indices.””44 In other words, and to state the point in Deleuze’s terms, the problematic space that ultimately makes sense of the “concept indices,” or of what we think we mean when we say “the temperature is ...” is concealed by the solution to the problematic space whereby the concept is then taken to be clearly tied to the set of properties that are subordinated to this concept. For both Chang and Mark Wilson, however, what allows for the possibility of the common sense, conceptual understanding of a predicate is the coherentism (for Chang48) or convergence of results (Mark Wilson49) that constitutes the meaningfulness of predicates but is then hidden and concealed by these very same predicates.

The account just sketched here overlaps somewhat significantly with the operationalism that one finds in the work of P.W. Bridgman and others, where it is argued that concepts are meaningless apart from the operational procedures that give them meaning and significance. Mark Wilson, however, accepts that a predicate may be legitimately freed from the variety of operational procedures that converge on similar results, and his account is not purely operational. The same was true for Chang. Where operationalism has its strengths is precisely in recognizing that the sense of a concept or predicate needs to be constructed, but where Wilson and Chang would differ, and Deleuze as well on my reading, is with respect to whether or not the predicate has an autonomous reality distinct from the operational procedures that give it sense. The best way to address this entire debate, on my account (see Bell, Deleuze’s Hume), is to abandon the very distinction between that which has a constituted existence and that which has an autonomous existence. This is just the move Bruno Latour makes as he deploys the concept of relative existence. For Latour, existence is not an all or nothing, either/or reality but is instead relative to the set of associations and elements that converge upon a reality that is then taken to be autonomous. Latour refers to this convergence of elements as collaboration, and thus relative existence is a process, meaning that ‘an entity ... gains in reality if it is associated with many others that are viewed as collaborating with it. It loses in reality if, on the contrary, it has to shed associates or collaborators.’50 Latour’s theory of relative existence is not a social construction theory, however, or it is not a theory which claims that it is society which provides for the relative existence of a given entity. To the contrary, society itself, Latour argues, must also be held together,

46 Wilson, “Predicate Meets Property,” 563.
47 Ibid., 566.
48 ‘The overall argument of this chapter can be summarized as follows. In making attempts to justify measurement methods, we discover the circularity inherent in empiricist foundationalism. The only productive way of dealing with that circularity is to accept it and admit that justification in empirical science has to be coherentist.’ (Chang, Inventing Temperature, 220). Chang defines coherentism as follows: ‘In basic epistemological terms, relying on the convergence of various standards amounts to the adoption of coherentism after a recognized failure of foundationalism.’ (Ibid., 156)
49 Recall Wilson, “This Thing Called Pain,” 244: ‘we obtain approximately similar readings from such a wide variety of distinct devices, for example, gas thermometers, liquid in glass thermometers, thermocouples, so called “sonic” thermometers, etc.’ that enables us to refer to the physical properties associated with temperature as being freed from their ‘operational underpinnings.’ In other words, it is the convergence of ‘approximately similar readings’ from a diversity of devices that leads to the sense that there is a fact regarding temperature that is distinct and separate from the operational procedures used to detect and measure the temperature.
50 Latour, “On the Partial Existence of Existing and Non-existing Objects,” 257. Latour provides multiple examples of this process. Pouchet’s theory of spontaneous generation, for example, had a number of collaborators, both humans (other scientists) and nonhuman (e.g., the museum equipment at the Rouen natural museum) which left the relative existence of spontaneous generation high. By 1866, however, Pasteur’s theory of fermentation had displaced Pouchet’s theory in that it had by this time increased its own heterogeneous array of associations, and thus its relative existence was much higher than that of spontaneous generation.
or it presupposes what you might call an equilibrium state of heterogeneous elements in collaboration. As Latour and Shirley Strum put it, ‘society is not what holds us together, it is what is held together,’\textsuperscript{51} and what is crucial to this holding together in collaboration is a combination of human and nonhuman resources. ‘As long as it is simply social skills that are brought in,’ and brought in to hold together the social group, ‘one does not get a society more stable and more technically developed than that of the baboons or the chimpanzees.’\textsuperscript{52} It is the very material resources, the nonhuman objects and artifacts, the texts we read, etc., that constitutes the relative existence of the social group.

We can now see, in closing, why literacy, the technology of reading and writing, the linear quality of the text, the ability to read a text quietly, etc., are part of the elements that enter into the formation of the relative existence of that which gives sense to our understanding of the world. These elements, along with many others, come to constitute the basis upon which we identify what is relevant to a situation. In his discussion of malapropism, Donald Davidson points out that we routinely identify what is relevant to the malapropism. Given the phrase, “In quest of this pinochle of success, I have often wrecked my brain for a clowning achievement...”\textsuperscript{53} we generally have no problem interpreting what is meant. This was why Davidson famously rejected the notion that language is conventional, if by convention we mean a set of rules that have been adopted and are then applied to the interpretation of a given circumstance.\textsuperscript{54} To the contrary, these rules are mere abstractions from the actual complexity of language use, a complexity of use that presupposes conditions that cannot be reduced to concepts or rules. The problematic space of convergence, consistency, or coherence is precisely the condition that provides sense and relevance to any given situation, what enables us to find the relevant meaning in a malapropism. Moreover, what goes into the production of this space of convergence and consistency, following Latour, includes the technologies we encounter – printed books, smart phones, etc. – plus the many other human and nonhuman elements that constitute the conditions whereby we make sense of the world. In the spirit of Davidson and Deleuze, Foucault refers to this condition that allows for the circulation of that which makes sense of the world as the historical \textit{a priori}. It is indeed a historical \textit{a priori} for, as we have seen, the elements that come to constitute the problem space that gives sense to the ways we think and speak of the world are constantly changing – the relative existence of what is taken to be relevant and crucial to making sense of the world waxes and wanes with historical conditions. Those with formal education, as we have seen, find formal problems relevant and move quickly to a solution, whereas those who cannot read will turn to empirical factors as most relevant to making sense of a situation. How, we should wonder, will social media, smart phones, and the technologies that are constantly with us, affect our sense of what is relevant or not to interpreting events. As Foucault might state this problem, what is the historical \textit{a priori} at work in this situation, with historical \textit{a priori} ‘defined as the group of rules that characterize a discursive practice: but these rules are not imposed from the outside on the elements that they relate together; they are caught up in the very things that they connect.’\textsuperscript{55} These \textit{a priori} rules are not rules in the sense of solutions or concepts that act from above to predetermine where elements do and do not belong. Foucault, along with Davidson, would thus reject the idea that language is at bottom conventional, or that it is fundamentally a set of rules one must learn. These \textit{a priori} rules are rather the consistency or convergence of relations that is inseparable from the relative existence of a concept or rule that is then taken to be autonomous and independent of the conditions of its emergence, and a concept that is clearly tied to a set of properties and elements. It is this

\textsuperscript{51} Latour and Strum, “Redefining the Social Link,” 276.
\textsuperscript{52} Ibid., 277.
\textsuperscript{53} Davidson, \textit{Truth and Predication}, 89.
\textsuperscript{54} This is found in the final lines of the essay on malapropism, “A Nice Derangement of Epitaphs”: ‘I conclude that there is no such thing as a language, not if a language is anything like what many philosophers and linguists have supposed. There is therefore no such thing to be learned, mastered, or born with. We must give up the idea of a clearly defined shared structure which language-users acquire and then apply to cases. And we should try again to say how convention in any important sense is involved in language; or, as I think, we should give up the attempt to illuminate how we communicate by appeal to conventions’ (Davidson, \textit{Truth and Predication}, 107). In other words, we should give up thinking of language as a set of rules we learn and then apply to particular cases.
\textsuperscript{55} Foucault, \textit{Archaeology of Knowledge}, 127.
historical a priori that allowed the Druids, without hesitation, to identify the B-52 as a bird, or the islanders to identify the sheep and goats as birds. It is the historical a priori that allows us to make sense of the world, or it enables us to make sense of the following passage (and with that, we let Foucault have the final word):

This book [Foucault’s Order of Things] first arose out of a passage in Borges ... This passage quotes a ‘certain Chinese encyclopaedia’ in which it is written that “animals are divided into: (a) belonging to the Emperor, (b) embalmed, (c) tame, (d) sucking pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camelhair brush, (l) et cetera, (m) having just broken the water pitcher, (n) that from a long way off look like flies.” In the wonderment of this taxonomy, the thing we apprehend in one great leap, the thing that, by means of the fable, is demonstrated as the exotic charm of another system of thought, is the limitation of our own, the stark impossibility of thinking that.56

References


56 Foucault, Order of Things, xv.