ALL MEANING IS NATURAL

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ABSTRACT

It is the received philosophical view that there are two fundamentally different types of meanings: natural ones and non-natural ones. Linguistic meanings are said to be of the second sort. Properly understood however, language is a physical, biological phenomenon. Indeed, it is an evolved species. In evolutionary biology, the physical significance of items is explained by reference to the physical significance of ancestral items and to features of the biological relationship of engendering. When language is investigated along similar lines, the natural/non-natural distinction ceases to appear fundamental. More fundamental is the distinction between phenomena capable of explanation within a relatively lower order physical theory and those that require an explanatory theory of relatively higher-order. From this perspective, talk of convention or non-naturalness in linguistics resembles that of function in biology: it serves only as a conversational shorthand for higher-order explanations.

Keywords: language, meaning, convention, Grice
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6.1. Language should be studied as a physical, biological phenomenon, not fundamentally different from the phenomena of natural meaning. Change is among its, and their, key features. At the first order the changes are causal. At the second-order, where the physical significance of linguistic productions gets explained, changes of changes are considered. Explanations of both orders are appropriate for both natural and non-natural meanings.
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PROEM: PLANS AND PRETERMISSIONS

When philosophers mention Paul Grice’s distinction between natural and non-natural meaning it is usually to briefly acknowledge a range of sentences that shall thereafter receive no further attention. These sentences share the unfavorable feature of allowing the word ‘means’ (and conjugational variants) to be plausibly switched for words such as ‘implies’ or ‘indicates’. Early forms of the distinction, which began taking shape in Plato and developed through every erudite period since, obviously predate this class of expressions. But the tendency of neglect is longstanding. By assigning almost all of human language to the non-natural side, tradition has secured for it a prejudice of attention. Taken alone the prejudice is unobjectionable; it becomes less innocuous when accompanied by the assumption that, unlike phenomena on the natural side, language cannot be satisfactorily explained without some recondite remainder. Like our philosophical forbears we are primarily interested in humans and human language. Unlike them we believe both sides of the distinction should be approached from a single methodological perspective. From it, all meanings look natural.

Since hopes for naturalizations and reductions are currently high, and since successful exemplars are few, our proposal to adopt such a methodological perspective is likely to evoke feelings of promise and disdain. Some of each will be underserved; and in some, one sentiment may give way to the other when details are considered. Nevertheless, a couple of precursory remarks may prevent a few foreseeable misconstruals and so help us to avoid some decidedly uncomfortable pigeonholes. First, we do not propose any analyses of the word ‘meaning’ or its cognates, nor do we relate these words to others in the familiar set of mentalistic vocabulary. Analyzing these terms is no part of our project.

1 These substituends are from (Schiffer 1972, 4). See also (Bennett 1976, 12), where ‘is natural sign or symptom of’ and ‘is evidence for’ are offered as alternatives.
To be sure, none can now say whether a complete explanation of language will require any items in the troublesome ontology birthed by semantic and mentalistic vocabularies. Nevertheless, all should agree that these terms have long enjoyed a suspicious double-life: each sometimes poses as explanans, other times as explanandum. From author to author they vary in definition and application; only their interdependence can be counted upon. We do not claim that no progress has been made in mapping the conceptual geography in which these terms get related, for indeed there has been some, nor do we claim that these terms are inherently exceptionable, for without at least a conversational understanding of them life would be considerably more difficult than it is. What we do claim, and intend to show, is that much of what goes on with language can be described without incorporating them in one’s theoretical vocabulary. Creating such descriptions, rather than involving analyses, involves appropriating new terms and defining them to suit the needs presented by observation.

Second, despite calling our approach a natural one, we do not aim to naturalize or reduce anything. Inasmuch as language consists of noises, marks, and bodily processes, which is to say, just so far as it presents itself to observation, it already is natural. More specifically, language is physical and biological. We merely hope that describing it as such, without overstepping those bounds, will help us to understand its complexities. Not being particularly concerned with the terms that have traditionally been used to describe language, except insofar as to show that others might be better suited to the task, and indeed might be used to account for the problems their predecessors create, we do not spend time determining what more basic objects their referents might resemble. It is a better policy, we believe, to begin with observations and define a vocabulary to suit them than it is to begin with a vocabulary and find objects for it to match.

So, no analyses, naturalizations, or reductions are attempted here. What then, it may be asked, do we plan to do? The answer is as simple as the task is hard. We want to explain, both in particular and in general, why linguistic productions have the physical significance they do. Roughly, by ‘physical significance’ we mean the set of causal effects the production can occasion. Importantly, we want the claims and predictions figuring in such an explanation to permit transparent comparison with claims and predictions of relevant physical sciences. If we should succeed in this task, or go some
way in that direction, our efforts will not have been wasted, for we would then truly have begun resolving some of the problems that a distinction between nature and convention was introduced to settle.

That distinction, and particularly its most recent formulation in Grice, provides us with a guide in our examination of language and language studies. Our strategy is as follows. We set the stage by reviewing the distinction's history. The following two sections oppugn two biases: first, the reliance on mentalistic vocabulary; second, the exclusive use of near-synchronic timeframes. The cynosure of section four is Grice. We review his distinction between natural and non-natural meanings as well as his reasons for preferring it to earlier formulations. In the final section we look closely at natural meanings, comparing them with language along three dimensions: ontological, ontogenic, and phylogenetic. We hope to establish that the distinction between natural and non-natural meanings does not cut along some fundamental, non-arbitrary division of things.

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2 In this group are words such as ‘ideas’, ‘intentions’, ‘inferences’, ‘beliefs’, ‘propositional attitudes’, etc. To be sure, we will not deny ourselves ordinary expository use of this vocabulary, but we neither seek to establish, nor presume anything more than conversational familiarity with it.
1 HISTORY

1.1 “Nature” and “convention” in the Western linguistics tradition

The distinction between natural and non-natural meanings was not original with Grice. Others are getting at the same idea, he says, when “they display an interest in a distinction between ‘natural’ and ‘conventional’ signs.”¹ This chapter reviews some influential anterior formulations. Since we aim to cover roughly 2300 years of history in a short space our review is necessarily inexhaustive and by no means penetrating. Nevertheless, a decent enough assessment of the distinction’s development can be had by singling out landmark figures and reviewing their relevant contributions. For some this has involved a direct reformulation of the distinction; others’ contributions have been less direct, many have merely shifted the foveal attention of language study.

One particular shift that interests us (for reasons to be explained in chapter 3) involves historic timeframes. Our history traces nearly a complete period of a hypothetical pendulum. Its path of oscillation begins at a point of relatively low historicity (Plato to Pre-Locke), reaches a high one at the opposite extreme (Condillac and Darwin), and then begins swinging back again (with Saussure). These changes are relevant to the nature/convention distinction because of the general rule that emphasis on conventionality as non-natural, to use Grice’s term, varies inversely with historical interest. That is, when the processes by which languages evolve are the focus of attention convention tends to be considered as a datum in need of explanation, not as a theoretical device of fundamental explanatory value.

1.2 Socrates: mimetic beginnings

To our knowledge the *Cratylus* is the earliest record of a discussion about how words, or "names" (*onomata*), are connected with objects. After some initial pleasantries the following dichotomy of opinions is put to Socrates.

HERMOGENES: I should explain to you, Socrates, that our friend Cratylus has been arguing about names; he says that they are natural and not conventional; not a portion of the human voice which men agree to use; but that there is a truth or correctness in them, which is the same for Hellenes as for barbarians.

This passage raises questions still discussed today. For instance, whether it is by agreement or by some more natural means that words and objects come to be associated? If by agreement, what features characterize such agreements? If by natural means, in what does such naturalness consist and how is its influence exerted? Hermogenes declares himself on the side of convention, pointing out that slave owners often give new names to their slaves. He argues that since the new names are as effective as the old ones there cannot be anything but a conventional connection between a name and its object. Not surprisingly, Socrates detects in this argument a view resting more on individual whim than on convention. Hermogenes is shown that if anyone could change the name of anything when and howsoever he pleased, a state of widespread relativism in the form of private word-object associations would ensue, thereby squelching rational discussion altogether. Since he and Socrates are themselves engaged in a rational discussion the proposal is retracted.

Hermogenes' quick concession is regrettable. He might have remarked that not everyone has a zeal for name changing and that even those who do also have a greater interest in talking to their peers than in renaming things haphazardly. Hermogenes similarly fails to mention that slave names represent only a small portion of everyday words. Without these challenges, the *reductio* uninhibitedly reaches its conclusion. The interlocutors pursue other options. Although the Socrates of the dialogue did not consider

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4 *Onoma* was used not only of proper names but also of what we might now describe as common nouns. Here we shall use 'name', 'word', 'object', and 'thing' (and their plurals) loosely. For example, the first two on the list could be used of interjections and last two of abstract concepts.

5 Plato, *Cratylus* (383), in (Plato and Jowett 1937, Vol. 3).
some more plausible, socially founded versions of conventionalism, he did offer a positive contribution that deserves attention. To avoid etymological circles in which names are related only to one another, Socrates posits an original state in which things are as yet unnamed. Into this state he introduces a name-giver, who, by analogy with the potential communicational benefits of gestural mimicry, is said to proceed in his task mimetically, verbally matching the essential natures of the things requiring names.

Borrowing Jesperson’s cheerful terminology we might say that Socrates’ proposal more closely resembles a prototypical “ding-dong” theory than it does their “bow-wow” competitors. 6 This is because Socrates does not envisage words as having entered the language onomatopoeically. Rather, he claims, original names should be created so that phonemic units and the lingual motions required for their production correspond to the essential natures of the objects named. For example, the letter ‘a’ is deemed a natural candidate for expressing roundness; “the consonants ‘d’ and ‘t’, by reason of ‘the compression and pressure’ of the tongue, are claimed to be naturally fitted ‘to imitate the notion of binding and rest’.” 7

Socrates recognizes that his proposal does not quite square with the data. For instance, supposedly soft, gliding sounds such as l appear in words to which they are unsuited (e.g. sklēron, “hard”). Also, Socrates was aware that pronunciations and spellings change, and that this might already have led to large-scale divergences between natures and names. Moreover, if the name-giver made even small errors in the beginning these could later amplify. Indeed, there is no guarantee that the name-giver had followed the hypothesized method. For these reasons Socrates compromises.

SCORATES: … I quite agree with you [Cratylus] that words should as far as possible resemble things; but I fear that this dragging in of resemblance, as Hermogenes says, is a shabby thing, which has to be supplemented by the mechanical aid of convention with a view to correctness; for I believe that if we could always, or almost always, use likenesses, which are perfectly appropriate, this would be the most perfect state of language; as the opposite is the most imperfect. 8

6 Jespersen 1959, 413-16.
7 Harris and Taylor 1997, 12.
8 Plato, Cratylus (435), in (Plato and Jowett 1937, Vol.3).
The dialogue concludes with Socrates and Cratylus agreeing that investigations of things should have priority over those of names. Cratylus, it seems, took the admonition too seriously, for according to legend he came to distrust names to such an extent that in later life he would communicate by gesture alone.

1.3 Aristotle’s triptych: pragmata; pathēmata; phōnē/grammata

Unlike Plato “Aristotle comes down squarely on the side of *thesis* in the *phūsis-thesis* controversy.” Questions about the correspondence between phonemes, their related lingual maneuvers, and essences are uninteresting for him. Thus, the nature side, as presented in the *Cratylus*, drops out of the picture with Aristotle. However, it would be a mistake to think that Aristotle is uninterested in the correctness of names. Names and their objects must match up, but they need not do so in any particular way provided there is consistency, which conventions are supposed to ensure.

As Householder notes, “all through *De Interpretatione* Aristotle emphasizes the arbitrariness of the sign (*kata sunthēkēn*).” From its very beginning he maintains that the connection between words and experience is unlike that between experience and things.

Now spoken sounds are symbols of affections in the soul, and written marks symbols of spoken sounds. And just as written marks are not the same for all men, neither are spoken sounds. But what these are in the first place signs of – affections in the soul – are the same for all; and what these affections are likenesses of – actual things – are also the same.

The influence of these remarks cannot be overestimated. Though incidental to the larger aim of the book, which presents a grammatical classificatory scheme for interrelating propositions, these comments became integral parts of what many still assume is common sense. For over two millennia scholars of successive generations have taught them to pupils. Until recently they did so largely without challenging or altering the central tenets. This is unsurprising. Given the conversational nature of the language in which they are presented, the ideas sound plausible, and in the absence of misgivings

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11 Aristotle, Ackrill, and Aristotle 1963, 43.
about the adequacy of the vocabulary in which they get phrased, or of a sufficiently well developed alternative vocabulary, it is either unnecessary or extremely difficult to propose competing descriptions. One of our aims is to dislodge this dogmatism; but first, Aristotle.

The quoted passage presents a triptych on which the first two panels are the same for all. On the first is a world of unitary nature \textit{(pragmata)}. The second panel, consisting of feelings in the mind\textsuperscript{12} \textit{(pathëmata)}, is impressed in such a way as to correspond directly with the first. Speech \textit{(phônē)} and writing \textit{(grammata)} together form the third panel, which may be variously attached to the others with conventions as hinges.

Unfortunately Aristotle is silent about how conventions arise and later maintain linguistic stability within a community. He claims “a name is a spoken sound significant by convention”, adding that the expression “‘by convention’ [is introduced] because no name is a name naturally but only when it has become a symbol” The same goes for sentences: “Every sentence is significant (not as a tool but … by convention).”\textsuperscript{13} These remarks give few clues.

Although the origins and details of conventions are unspecified, Aristotle clearly deems conventions necessary. For him,

\begin{quote}
Human rationality itself demands a stability in names which does not collapse between one line of a syllogism and the next. So the convention which guarantees this continuity is not merely a social custom or habit, such as adopting a style of dress, or following a certain cycle of annual feast days. Naming-conventions, and their stability, are necessary if language is to be an expression of logos and human speech behavior is to be that of a rational creature.\textsuperscript{14}
\end{quote}

Any name will serve as well as any other provided everyone follows the conventions governing its use. Aristotle also observes that poets are frequent transgressors of convention (and thereby sometimes convention setters). That their transgressions are

\textsuperscript{12} We use ‘mind’ very loosely in attempting to sketch Aristotle’s view. It applies to the complex of sense organs, heart, \textit{nous} and \textit{psyche}. Hilary Putnam notes that “sensations did not come to be considered part of the mind until very recently…. In Aristotle’s system, visual sensations occur in the sense of sight itself.” How these various components interact is unclear, though Aristotle claims the heart is an intermediate between sense, \textit{nous} and \textit{psyche}. See “How Old is the Mind?” in \cite{PutnamandConant1994}.

\textsuperscript{13} Aristotle, Ackrill, and Aristotle 1963, 44-45.

\textsuperscript{14} Harris and Taylor 1997, 25.
understandable is potential counterevidence to conventionality. On metaphor Aristotle writes,

> Metaphor consists in giving the thing a name that belongs to something else; the transference being either from genus to species, or from species to genus, or from species to species, or on grounds of analogy. That from genus to species is exemplified in ‘Here stands my ship’; for lying at anchor is the ‘standing’ of a particular kind of thing. That from species to genus in ‘Truly ten thousand good deeds has Ulysses wrought’, where ‘ten thousand’, which is a particular large number, is put in place of the generic ‘a large number’. That from species to species in ‘Drawing the life with the bronze’, and in ‘Severing with the enduring bronze’; where the poet uses ‘draw’ in the sense of ‘sever’ and ‘sever’ in the sense of ‘draw’, both words meaning to ‘take away’ something .... Now and then, too, they [poets] qualify the metaphor by adding on to it that to which the word it supplants is relative. Thus a cup is in relation to Dionysius what a shield is to Ares. The cup accordingly will be metaphorically described as the ‘shield of Dionysius’, and the shield the ‘cup of Ares’.

This creative process, sometimes called analogy or metaphoric extension, is one about which we say more in §3. There we argue it is part of a family of processes responsible for bringing about linguistic change. We now note only that linguistic exploitations of this sort preclude adopting a straightforward view of conventionalism.

1.4 Augustine’s intentions and Ockham’s perceptions

Aristotle’s work found sanctuary in Churches through the difficult times to follow Classical Antiquity. In 397, Augustine of Hippo writes:

> [A] sign is a thing which, over and above the impression it makes on the senses, causes something else to come into the mind as a consequence of itself … Natural signs are those which, apart from any intention or desire of using them as signs, do yet lead to the knowledge of something else, as, for example, smoke when it indicates fire .... Conventional signs on the other hand, are those which living beings mutually exchange for the purpose of showing, as well as they can, the feelings of their minds, or their perceptions, or their thoughts. Nor is there any reason for giving a

\[15\] Quoted in (Harris and Taylor 1997, 31-32).

\[16\] Interestingly, most philosophers of language continue to set aside as irrelevant those cases not related to so-called “literal meanings.” Grice has of course had a considerable influence in swinging the pendulum the opposite way. But it still has far to go. Idioms, phrasal verbs, colloquialisms, and functional vocabulary (among other aspects) comprise a large part of language, and one not easily accounted for by traditional means. No plausible account can ignore these features.
sign except the desire of drawing forth and conveying into another’s mind what the giver of the sign has in his own mind.\textsuperscript{17}

With Augustine the distinction takes new shape. The nature side, which was absent from discussion in Aristotle and now seemingly odd in Plato, comes to resemble more modern versions. His example of smoke’s leading to thoughts of fire is like examples Grice gives. Also, his claim that people use conventional signs for conveying feelings in the mind foreshadows Grice’s intention-based account of non-natural meaning. Augustine thus marks a milestone in the distinction’s history; in §4.3 we argue that to resolve an ambivalence in his own account Grice could have made use of Augustine’s claim that any item is a sign only insofar as it causes something else to come into the mind as a consequence of itself.

Jumping ahead nearly a millennium, and traversing nearly the same number of miles, we find Ockham writing in Munich in 1323 as follows:

I say vocal words are signs subordinated to mental concepts or contents. By this I do not mean that if the word ‘sign’ is taken in its proper meaning, spoken words are not properly and primarily signs of mental concepts; I rather mean that words are applied in order to signify the very same things which are signified by mental concepts. Hence the concept signifies something primarily and naturally, whilst the word signifies the same thing secondarily .... This is what is meant by the philosopher when he says ‘Words are signs of the impressions in the soul’. Boethius also has the same in mind when he says that words signify concepts .... A concept or mental impression signifies naturally whatever it does signify; a spoken or written term, on the other hand, does not signify anything except by free convention.\textsuperscript{18}

With Ockham the nature side of the distinction gets associated with perceptions, and since he retains the Aristotelian idea that the world impresses itself similarly on all its observers this invites associations with necessity, or in Grice’s account, factivity, a point we address in §4.3.

\textsuperscript{17} Hutchins, Encyclopaedia Britannica, and University of Chicago 1952, Vol. 18, pp. 636-637. Other examples of natural signs listed include “the footprint of an animal passing by” (mentioned in (Schiffer 1972, 4) and “the countenance of an angry or sorrowful man” (included by Condillac, see §1.7 below).

\textsuperscript{18} Quoted in (Davis 2003, 2).
1.5 Port Royal: the sentence and its parts

Lancelot and Arnauld’s *Grammaire générale et raisonnée*, published in 1660, altered the nature-convention distinction in two ways. First, by shifting emphasis from idea-word pairs to thought-sentence pairs, they presented a challenge to the view that human language is entirely conventional. Second, by speculating on the nature of linguistic change, particularly how certain categories of words give rise to others, they spurred interest in language origins and in historical linguistics, both of which would later greatly affect the distinction.

The first of the challenges was not very far reaching since both authors accept Aristotle’s claim that actual things and the affections in the soul they cause are the same in all people, and that thoughts can be variously expressed with equal effects. Although both authors believe that speech is constrained by the nature of thought, and thus not entirely conventional, neither assumes that the rational principles they present for the study of foreign languages will alone suffice as teaching devices. The plethora of irregularities they notice precludes this hope, and so they claim that each language can be learned only by close and careful study.

However, the Port Royal teacher-scholars maintain that if thought is the same everywhere, and if speech represents thought, then to some extent the range of possible linguistic constructions must be constrained by the forms which thought can take. In other words, every well-formed sentence must contain words that belong to certain grammatical types, which map inherent properties of thought. These types must combine in predictable ways if speech is to be understood.\(^{19}\) Although the rules for correct combination may vary across languages, the types themselves cannot.

The second way in which Lancelot and Arnauld influenced the nature-convention distinction was by speculating on linguistic change. They claim that a desire to abbreviate influences all languages and that this desire is capable of generating new word categories, for instance adverbs, which are said to originate from longer preposition-noun constructions. We might today describe this desire to abbreviate in terms of requirements

\(^{19}\) It is likely for this reason that they were later controversially presented as heralds of Generative Grammar.
for efficient communication, a feature of language also noted by Horne Tooke, about whom more is said in §2.1. Historical interests came to focus on language origins in the next century, and for the next few centuries examining changes with an aim to discovering the underlying forces responsible became the method of doing linguistics. These shifts brought significant changes to the nature-convention distinction. At least equally important in bringing about the ensuing methodological changes is John Locke.

1.6 Locke's misgivings that conventions suffice

Locke's influence on the nature-convention distinction rivals that of Aristotle. In An Essay Concerning Human Understanding, after contemplating the need for a means of expressing ideas and the suitability of vocal manipulations for this task Locke writes,

Thus we may conceive of how words, which were by nature so well adapted to that purpose [communication], came to be made use of by men as the signs of their ideas; not by any natural connexion that there is between particular articulate sounds and certain ideas, for then there would be but one language amongst all men; but by a voluntary imposition, whereby such a sound is made arbitrarily the mark of such an idea. The use, then, of words is to be sensible marks of ideas; and the ideas they stand for are their proper and immediate signification.

From this passage it is clear that Locke shares with Aristotle what Sperber and Wilson call "the code model of verbal communication." This is the hypothesis that communication involves: 1) the encoding of a thought by a speaker; 2) the linguistic transmission of this thought to a hearer; and 3) the hearer's decoding of the thought. Aristotle assumes that if conventions are in place this process will work effectively; Locke sees a different way for it to fail. Reviewing some features of his general view of how words and ideas come to be associated will help to clarify.

First, words and ideas are arbitrarily associated. Locke gives a short argument for this in the passage above. If the connection were natural all humans would speak the same language; they do not, so it is not. Little is said however about conventions specifically. Although Locke certainly had a great influence on the historic shift in

20 Locke and Nidditch 1975, Book III, Ch. 2. §1.
21 Sperber and Wilson 1986, 3-6.
linguistics, he himself seems to have been unconcerned both with how words came to have the significations they do and with the types of changes undergone within languages.\textsuperscript{22}

Second, individuals voluntarily associate words and ideas, and do so each time an idea occurs which is in need of expression. Thus, even when someone chooses a word without conscious deliberation, and when the choice accords with the typical descriptive practices of one’s community, Locke says the association results from a voluntary act on the part of the individual speaker.

Third, only the speaker is truly aware of the connections he makes between ideas and words. This is because each person’s ideas are invisible to all but himself, and therefore so too is the first two thirds of the “idea-connection-word” complex. This last suggestion strikes us as improbable, for we are unable to detect in ourselves the type of semantic understanding Locke supposes each of us to have. Grasping ideas without words is notoriously difficult, but we concede that some may be able to manage the task at least roughly. Grasping the relationship between wordless ideas and words not only eludes our introspective efforts but has eluded thousands of years of philosophical attention.

Nevertheless, it is easy to see how, if accepted, this would cause the problem he envisages as underlying communication: although we are ourselves supposed to be aware of how our ideas and words match up, we can never be sure that others are making the same matches. Thus there is a possibility that none of us truly understands the other. \textit{With Locke conventions cease to guarantee successful communication.}

Ironically, although Locke’s views on language and mind were probably more influential than those of any other author of the period, they led in what was for him likely an unexpected direction. According to Harris and Taylor the following is among the passages most frequently quoted in the century after Locke’s own. To it they also partly attribute a role in the spurring the ensuing interest in historical linguistics:

\textsuperscript{22} However, Locke recognizes a need for explanations in this domain as is clear from the quotation to follow.
It may also lead us a little towards the Original of all our notions and Knowledge, if we remark, how great a dependence our *Words* have on common sensible *Ideas*; and how those, which are made use of to stand for Actions and Notions quite removed from sense, have their rise from thence, and from obvious sensible *Ideas* are transferred to more abstruse significations, and made use to stand for *Ideas* that come not under the cognizance of our senses .... And I do doubt not, but if we could trace them to their sources, we should find in all Languages, the names which stand for Things that fall not under our Senses, to have had their first rise from sensible *Ideas*.

This passage prompted many distinct projects. Some, such as Horne Tooke, were inspired to investigate the birth of functional words via a need for despatch. Others hoped that through etymology knowledge of something resembling an Adamic language could be regained. This, they thought, would shed light on the nature of true and as yet uncorrupted thought. Quite against Locke's own view, many others assumed that developments of language and thought occur in tandem, and so arose beliefs that by looking at the history of a language we might gain insight into the thoughts of its speakers. From this strain also developed a great deal of what we today view as pejorative linguistics, in which contrasts of sophistication were drawn with home languages tending to fare best on the scales. Each movement affected the nature-convention distinction differently, but we must restrict our attention to a few.

### 1.7 Condillac: language is not arbitrary; it's analogically developed

Like Locke, Etienne Bonnot, Abbé de Condillac, was importantly involved in the transition to an era of historical-linguistics. Like Rousseau and Herder, he influenced this shift through his belief that "in order to separate what is art from nature, we must push toward the origin," where the intended origin is that of thought and language. Each of these latter three men proposed highly influential accounts of hypothetical states and processes through which language might have evolved. For Condillac the process was one of analogy. Some preliminary remarks about the distinctions he drew between signs will help to clarify this notion. Signs, says Condillac, are of three sorts: accidental, natural, and artificial.

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23 Locke and Nidditch 1975, Book III, Ch. 1. §5.
24 Aarsleff 1982, 159.
Accidental signs are uniquely connected in individuals. For instance, a given woman might associate the smell of popcorn with thoughts of her father because as a child it was he who would take her to the matinees. Thus, signs of this type relate to particular circumstances in the minds of individuals. Others need not share such relations.

Under the heading 'natural signs' is lumped all the cries involuntarily made by humans: shivering brrrrrrrs caused by winter's cold; howls of pain; oohs and aahs of lovemaking. Also included are the noises of non-human animals. For Condillac, natural signs must be physiologically induced; once faked, the same sounds are no longer considered natural signs.

Lastly, artificial signs comprise human language. This class of signs is not limited only to words or to groups of words; any noises voluntarily made to affect the behavior of others falls in that category. In his early writings Condillac claims that artificial signs bear only an arbitrary relation to our ideas, but he later recants this claim because of his theory of the development of language by a process of analogy. The theory is as follows.

In the earliest stages humans had no voluntary control over their expressions, their "communications" involved only natural signs. At sometime one among them gained voluntary control of a natural sign. "For example, he who saw a place in which he had been frightened, mimicked these cries and movements which were the signs of fear, in order to warn the other not to expose himself to the same danger."25 Condillac claims this crucial step is made possible by the observation and exploitation of correlations between natural sign and situation of use. From that first voluntary use of a natural sign all of human language is said to have developed on a basis of analogy. This development begins with gesture, which itself develops to remarkable extents.

There will be thus no ideas that the language of gesture cannot express. And it will express them with all the more clarity and precision as analogy appears more perceptibly in the series of signs chosen. Perfectly arbitrary signs will not be understood because, since they are not analogous, the meaning of a known sign would not lead to the meaning of an unknown sign. It is analogy that makes up the whole of languages.26

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25 Quoted in (Harris and Taylor 1997, 146). A similar story is told at (Grice 1989, 292).
26 Quoted in (Harris and Taylor 1997, 149).
With these ideas we sympathize. As with Aristotle’s remarks on metaphor there seems to be some truth in the idea that known relations are exploited in the production of novel expressions. In §3 we refine these ideas by defining an engendering relation. The notion of engenderment, like that of analogy for Condillac, holds a central position in our view of how language develops.

Condillac’s speculative or hypothetical genealogy of human language prompted numerous competing proposals. In many places the accepted view of the time was that of the church: To man, who appeared in the Garden of Eden only some five-to-six thousand years ago, was given language by God. Many of the proposals presented a direct challenge to this view, and in addition they were being produced with what is said to have been a general lack of systematicity. This eventually led to the 1866 injunction of the Linguistic Society of Paris that “no papers were to be presented any more about the origin of language, that being too speculative and too fruitless an issue.”

1.8 Darwin justifies “the science of Historical Linguistics”

Just seven years prior to that infamous 1866 injunction, Darwin’s *On the Origin of Species* was published. Its influence was of course far reaching. As Koerner remarks,

> No doubt, Darwin’s *Origin of Species* had first and foremost a tremendous impact on Victorian England, in matters of science as well as religion, morals and social attitudes in general (cf. Young 1970). But in regard to questions pertaining to language and, in particular, the science of language, England was at best in second place behind Germany.

In Germany linguists such as August Schleicher suggested that languages are organisms, and that linguistics is a natural science. He writes,

> Languages are natural organisms that came about independently of the will of man, grew according to certain laws which also determine their development, ageing and death ... Glottics, the science of language that is,

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27 Seuren 1998, 75.
28 See Konrad Koerner’s forward to (Schleicher et al. 1983, x).
is therefore a natural science.... Its method is identical to that of other natural sciences.29

Many ridiculed Schleicher for his view of language as organism, assuming his suggestion to have been presented not as a metaphorical description or as a proposal for adopting a biological methodology, but rather as statement of literal belief. Whitney was perhaps the most vocal opponent.30 Others, such as Darmesteter in his La Vie des mots, which was later titled Histoire des mots to avoid vitalist connotations, were influenced by Darwin in different ways. Instead of describing languages as following life cycles like those of natural organisms, Darmesteter claims that through human interactions words undergo a struggle for survival, one in which less frequently used words tend toward extinction.

Although vitalistic theories and the general Darwinian approach faced some harsh criticisms, few, including Whitney, criticized the proposal that linguistics be treated as a natural science. The assumption that it should received an early and influential formulation by Müller, who claims that

the language which we speak, and the language that are and that have been spoken in every part of our globe since the first dawn of human life and human thought, supply materials capable of scientific treatment. We can collect them, we can classify them, we can reduce them to their constituent elements, and deduce from them some of the laws that determine their origin, govern their growth, and necessitate their decay; we can treat them, in fact, in exactly the same spirit as the geologist treats his stones and petrifications – nay, in some respects, in the same spirit in which the astronomer treats the stars of heaven or the botanist the flowers of the field.31

What is most important in this passage is not the suggestion that linguistics admits of scientific treatment, but rather that laws similar to those governing phenomena in other disciplines might be detectable for linguistic changes. Indeed it was Müller "who rephrased Grimm's term Lautverschiebung ('sound shift') to 'sound law'."32

29 Quoted in (Schleicher et al. 1983, 6-7). In actual fact Schleicher's early work predates Darwin's "Origin of Species." It was only later that Schleicher professed an affiliation with the great biologist, and even then it is arguable that there is very little of Darwin's views to be found in Schleicher's work. See Peter Maher's introduction to same (xxvi-xxx).
30 Nerlich 1990, 12-16.
31 Quoted in (Harris and Taylor 1997, 188).
32 See introduction to (Schleicher et al. 1983, xxx).
We can divide the influences of Darwin’s *Origin of Species* on the nature-convention distinction into two trends. First is the shift toward treating linguistics as a natural science. The successes Darwin had in describing the biological world encouraged linguists that sufficient rigor might offer similar rewards regarding language. Although universal admission that we are biological organisms with an evolutionary history like that of other animals has still not come, none can reasonably doubt that we have always spoken as we currently do. This is in part due to the second of Darwin’s influences, namely the adoption of an almost exclusively historical paradigm. Darwin’s work offered a justification for comparing languages and tracing their lineages, a project already underway but previously lacking specific methodological support. In the years after Darwin historical-linguistics became the dominant research paradigm.

Together these two trends made languages seem less arbitrary than had previously been supposed. While most still believed that any sign was as good as any other for signifying the objects it did, a deeper understanding of the reasons current signs were in use was in the process of being developed, and with advances came convictions that signs followed patterns of their own, quite independently of the intentions of their users. To be sure, signs were still considered conventional, but this belief became tempered. Saussure expresses the emerging opinion well: “Because the sign is arbitrary, it follows no law other than that of tradition, and because it is based on tradition, it is arbitrary.”

1.9 Saussure: a twofold break with tradition

We conclude our historical review with Saussure, not so much because he himself reformulated the nature-convention distinction, but because he is generally considered to mark the beginning of the current approach to linguistics, and in this the distinction takes new shape. Two points in particular deserve mention. The first is that Saussure challenged the traditional idea that the role of language is to express thought. The second is that he distinguished synchronic from diachronic linguistics, and thus partly ushered in the now almost exclusively synchronic approach.

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33 Quoted in (Burgess 1992, 18).
Against the code model of communication endorsed by Aristotle and Locke, and indeed by most authors so far considered, Saussure claims that ideas do not exist fully formed in the mind prior to receiving linguistic expression. He writes,

The characteristic role of language with respect to thought is not to create a material phonic means for expressing ideas but to serve as a link between thought and sound, under conditions that of necessity bring about the reciprocal delimitations of units. Thought, chaotic by nature, has to become ordered in the process of decomposition. Neither are thoughts given material form nor are sounds transformed into mental entities; the somewhat mysterious fact is rather that “thought-sound” implies division, and that language works out its units while taking shape between two shapeless masses.34

Regarding the second point, synchronic and diachronic perspectives respectively refer to considerations of language as a state at a time, along “the axis of simultaneities”, and to focus on transitions between states, along “the axis of successions”. The first style of doing linguistics might be compared with examining a photograph since its components remain static. Diachronic studies on the other hand are primarily concerned with changes and methods of change.

While “Saussure’s distinction between synchronic and diachronic linguistics was read by later structuralists as a rejection of the historical study of language,” some, such as Koerner, convincingly maintain that “far from being an iconoclastic revolutionary, Saussure … remained true to his historically based Neogrammarian training.”35 Saussure’s actual appraisal of the historical-linguistic tradition that dominated Europe through the 18th and 19th centuries, though of undoubted historical interest, is not particularly important here. What is important is that he was largely responsible for bringing about today’s era of synchronic linguistics.

34 See (Saussure 1965, 115). Aarsleff suggests this insight was prefigured in Rousseau, Condillac, Maupertuis, and Diderot, all of whom are said to have recognized the “linearity of thought,” by which is meant that prior to receiving linguistic expression thought is unordered, at least temporally unordered, occurring instantaneously and being decomposed only by aid of language. See (Aarsleff 1982, 157).
35 Koerner et al. 1999, x-xii.
2 FROM THOUGHTS TO WHATS

2.1 Roots and Branches

Talk of thoughts, ideas, intentions, etc comprises the richly entwined root system of language study. Most assume that explaining language without these terms is about as likely of success as transplanting a tree by felling it. Some small few (like us) hope that the freshest of buds can be grafted with the understocks of other sciences. In this section we point to sites of traditional root rot and outline some advances of topworking.

Less floridly, we argue that certain features of the traditional view of mind and of the mind’s involvement with language are at best unclear and at worse false. The first claim we reject is what Aasleff calls the Uniformity Assumption. It states that humans are and always have been essentially alike in their thoughts. We note two problems for the claim: 1) typing thoughts is not an easy thing to do, and 2) it is plausible to assume there are inter- and intra-personal mental differences through time.

The second claim we reject is what Sperber and Wilson call “the code model of communication” according to which communication is achieved by encoding and decoding messages. Thoughts are the traditional messages. Again we note two problems: 1) that thoughts do not, in any definite sense, precede speech production, and 2) understanding language involves more than decoding.

The “advances of topworking” we outline involve abandoning mentalistic vocabulary in favor of some more easily managed alternatives. We follow Quine in examining what he describes as “points where empiricism has taken a turn for the better.” For us these steps are vocabular shifts made in language studies. They proceed from talk of ideas to words to sentences to behavior to brains and biology.

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2.2 The Uniformity Assumption

The Uniformity Assumption, says Arslieff, was “one of the great commonplaces of the eighteenth century.”37 In support he quotes Locke: “Men, I think, have been much the same for natural endowments in all times;” Hume: “mankind is so much the same, in all times and all places, that history informs us of nothing new and particular;” and Du Marsais: “The different avenues that different peoples have taken to express themselves are subject to two sovereign rules of uniformity and variety; there is uniformity in the essential nature of thought, and variety in the avenue followed and in the expression.” Other authors of the same period should not be hard to find and, as chapter 1 shows, the Uniformity Assumption was popular long before the eighteenth century. (Consider for example the similarity between the translation of Aristotle’s opening passage of De Interpretatione and that of DuMarsais above.) Nor is the uniformity assumption merely an historic relic, it has modern supporters; but the once great commonplace has become a controversial hypothesis.

There are at least three reasons for thinking the uniformity assumption false. People differ importantly from their peers, from themselves at various stages of life, and from their ancestors. Their distant progeny will assuredly differ from them. We briefly examine each of these reasons, but before doing so a more fundamental objection requires attention: there is no reliable method of determining sameness in the mental realm. If the objection is sound, the Uniformity Assumption can no more be rejected than endorsed.

2.2.1 How do we type mental stuff?

The first problem affecting anyone who wants to understand the uniformity assumption is its almost complete lack of specificity. For Aristotle it is “feelings in the mind” that are the same across and within persons; for Locke, “natural endowments”; DuMarsais accepts a uniformity of the “essential nature of thought”; and Hume endorses an unnamed similarity. Of this bunch the most difficult conceptions to regain are surely Aristotle’s of “the mind” and its “feelings”. Conversely, Locke’s “natural endowments” are easily

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37 Arslieff 1982, 159. The quotations given in support are from the same.
conceived. The human capacity to learn to talk is indeed at least currently universal, but
acknowledging this fact does not take us very far toward comparing particular thoughts
or thought processes. Hume clearly intends that his comments apply to something like
DuMarsais’s “essential nature of thought,” though they might equally well be made of the
number of digits grown on human extremities, allowing that it is not absolute numbers
that have remained roughly constant but the probabilities of being born with (or keeping)
all twenty fingers and toes.

For argument’s sake we settle on “thought”. This is, after all, a concept or type of
thing about which each of us has at least an intuitive understanding. Also, it is thoughts
that are most frequently invoked in current discussions of language. For help with the
details we turn to Wayne Davis, author of “Meaning, Expression and Thought.” Davis
does not share our misgivings about successfully comparing thoughts or about using them
as a basis for explaining why linguistic productions have the effects they do. The details
that concern us are allegedly simple features of thought, and about them Davis’s account
accords with standard views taught in most introductory classes to the philosophy of
mind or language.

He claims that thoughts are individuated on the basis of their abstract contents,
and that these contents are expressed by sentences. To keep thoughts in touch with
brains he distinguishes thought tokens, which are said to exist in the heads of those who
have them, from thought types, which are external, abstract, and therefore supposedly
able to make room for necessary truths or falsehoods. He further maintains that both
thought tokens and thought types are only contingently related to sentences. This is
because a single thought may be variously expressible, for instance in different languages
(il pleut; it is raining); or in the same language (all men are animals; every man is an
animal); or in some hypothetical language which may have resulted if history had taken
us along a different path (here any example will do). Also, a single sentence can express

38 Davis 2003, 316, 336, 497.
39 Davis 2003, 426.
40 Davis 2003, 315-16.
41 Davis 2003, 337-342.
more than one thought (flying planes can be dangerous). It is thus that thoughts are separated from brains and language, and yet claimed to admit of easy comparison.

2.2.2 A circular reply: ... thought-meaning-convention-thought ...

Most standard stories in philosophy have standard objections. In this case one of the objections is that we do not really understand how thoughts are “expressed” or “grasped.” To this Davis has an answer: “The sentences of any given natural language express particular thoughts in virtue of the conventions constituting that language,” or in multilingual cases, “since the sentences have the same meaning they express the same thought.” Thus, sentences express the thoughts they do in virtue of the meanings they have, and they have the meanings they do in virtue of the conventions of the communities where the sentences have been, are, or could be intelligibly spoken.

So conventions are the grounding point. Those of us unsure of the steps leading downward to conventions are at this point happy to have hit the bottom level. But when we ask about conventions we are often told only that they are regularities of action or of belief, sometimes also that they involve mutual knowledge of such regularities, other times that they result as solutions to coordination problems. This feels to us more like marsh than bedrock. If on the one hand conventions are regularities of belief, then unless beliefs are somehow separable from thoughts the circle is tight indeed. If on the other they are regularities of action, then we would like (and seem entitled to) an account of how the regularities arise, one that does not itself essentially rely on such items as thoughts, intentions, desires or meanings, which is what conventions were invoked to explain.

Davis defines ‘convention’ as “a way of doing things ... that is common, socially useful, self-perpetuating, and arbitrary.” This is a curate’s egg. Some parts are obviously correct under a charitable interpretation, albeit one teetering on vacuity; others are decidedly false. First, if ‘common’ is assumed to specify some indistinct but sufficiently large number of a group for whom an act is conventional, then it is

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42 Davis 2003, 335-336.
43 Davis 2003, 216.
unobjectionable to claim that conventions are common, though as Millikan notes, problems will inevitably arise not only with attempts to specify this indistinct number, but also with attempts to specify the group for whom an act is conventional.\textsuperscript{44}

Second, in defining conventions as socially useful, Davis may be making a normative proposal, namely that the word ‘convention’ should be applied only to acts with social worth. If, however, he is classifying our pre-theoretic intuitions on the matter it seems a mistake to say all conventional things are socially useful. Bloodletting, for instance, was once considered a tried and true remedy for fever, inflammation, and ironically, for hemorrhage, and although it was misguided it seems to have been a conventional treatment.

Third, regarding a convention’s self-perpetuation, obviously \textit{a way of doing things} is not itself the type of thing that enters into causal relations. Rather, we use that expression as a sort of short hand or higher-order description of the similarities noticed between the actions of individual objects. The self-perpetuation of human ways of doing things can be considered in terms of things transferred, for instance from parents to children, teachers to pupils, and peers to peers. The problem then is to explain how the transferred practices came to be as they are, and how the transfer is achieved. Merely saying that conventions are self-perpetuating is at best a premature attempt at causal explanations.

If ‘arbitrary’ means ‘unnecessary’, that is, that things might have been different given differences in our causal history, then that word’s inclusion in a definition of ‘convention’ is not incorrect, but merely otiose. Postulating a small but significant, sufficiently archaic change makes it easy to imagine things dramatically different from the current state. Not only might words for things be different, but we ourselves might be different. The dominant species might be a different one. Presumably there might be an entirely different biosphere. With even small alterations swim bladders may not have evolved into lungs and thus discussions about how our words might have sounded become strange indeed. In §3.5 we argue that although the connection between sounds and the effects they occasion is arbitrary, its degree of arbitrariness varies inversely with

\textsuperscript{44} See Ruth Millikan, “In Defence of Public Language” in (Antony and Hornstein 2003).
time. In other words, across very long temporal divides the probability of one state giving rise to another is always near zero, but as timescales decrease such probabilities increase to non-negligible numbers.

There seems to be something obviously right in the view that conventions are involved in determining why linguistic productions are as they are and have the effects that they do; however, without an independent account of conventions they cannot serve as a basis for grounding meaning or thought, nor as one by which particular thoughts or meanings might be compared. We want to know how past events sanction or prohibit predictive success in current ones, and this requires a causal historical account.

Talk of conventions has the advantage of being temporally backward-looking. This is an advantage because without knowing where we have been it is impossible to understand why we are where we are. To be sure, in learning a language we become better able to anticipate effects and to react anticipatably to linguistic productions. This much understanding does not require a backward-looking approach; but if we want to explain why the sounds of our words are as they are and why those sounds are able to occasion the effects that they do, then there is no escaping mention of how things were previously. Our words sound as they do because of a complex evolutionary process that provided us with our current physiological abilities. Our words occasion the effects they do because ancestral productions had the effects they had and because of the facts of engendering. We return to these points in the next chapter. For now we continue in our examination of the Uniformity Assumption.

2.2.3 Seeing is not always believing

A rough distinction will help with the objections that follow. We borrow it from the “authors” (some essays in the collection are entirely pictorial) of *Ways of Seeing*. Like many before them they are interested in the interrelation between what we see and what we know. They write,

In the middle ages when men believed in the physical existence of Hell the sight of fire must have meant something different from what it means today. Nevertheless their idea of Hell owed a lot to the sight of fire
consuming and the ashes remaining—as well as to their experience of the pain of burns.\textsuperscript{45}

The authors go on to distinguish between "the small part of the [seeing] process which concerns the eye’s retina" and the larger consciousness-infused process of sight. For our part, introducing consciousness seems an unlikely step toward making clear what is obscure in talk of other mentalistic notions. However, everyone must admit that perception extends beyond the world’s bombardments or wavy interactions with the external parts of observers. When we wish to say what stays the same and what changes across persons and times, it helps to note that differences can be of at least two sorts.

The first type of differences involves what we may call "uninterpreted perceptions". This type is guaranteed since no two people can be in the same place at the same time, and no one person can be in the same place and time more than once. Thus the world cannot affect two people in the exact same way at the exact same time, nor can it affect one person the exact same way more than once. However, we should not let this fact obscure a more important one, namely that people exhibit differences of discriminatory capabilities. Some have perfect vision and other weak eyes; some are sommeliers and some cannot tell ports from pinots. Across all modes through which we sensuously interact with the world each of us differs from others and from our previous and later selves. Whether these types of differences alone count against the Uniformity Assumption is difficult to say because the language in which it is expressed is not geared toward fine-grained comparisons. We expect the traditional answer is that these differences do not amount to mental ones and are therefore irrelevant.\textsuperscript{46} Anyone who adopts this defence, however, invites questions about the point at which sensory events become, or give rise to, mental ones, and those questions are notorious stumpers.

The second type of differences involves seeing, on a broader conception of that concept. Opposing it to the first type we may say it involves "interpreted perceptions". If differences can be established in this domain the Uniformity Assumption is in jeopardy.

\textsuperscript{45} Berger 1972, 8.

\textsuperscript{46} As Hilary Putnam notes, "sensations did not come to be considered part of the mind until very recently." See "How Old is the Mind?" in (Putnam and Conant 1994, 4).
Unlike their less sophisticated cousins, this type of perceptions seems to depend on what is paradigmatically mental, namely, knowledge. Thus it is primarily differences of the second sort that the objections are intended to establish.

This distinction between interpreted and uninterpreted perceptions is obviously a gross oversimplification of what is involved in experience. Each side could be further subdivided and each divided part more accurately described. Also, rather than representing mutually exclusive sides the two extremes should be considered as forming the edges of a single range. Luckily, precision is not required to demonstrate differences of a sort that threatens the Uniformity Assumption. In fact a lack of precision may be a boon, for just as microscopes are not the best tools with which to examine mammoths, precise theoretical tools may not help with the fuzzy claims in question.

2.2.4 Differences between neighbors (and groups of neighbors)

The first objection claims there are differences between the mental lives of different people living at the same time. Take one neighbor who is an electrician and another who is not. Among the electrician's tools are such things as fish tapes, bender heads, and signal throwers. The claim is that he sees these things in a different way than does his neighbor, or in the language of the last section, these tools cause in him interpreted perceptions unlike those caused in his fellow. He sees his tools as the tools they are, that is, as useful for certain types of job. By contrast, the untrained man, though he may in fact see the tools as tools, will presumably not have an identical type of experience as that occasioned in the electrician.

A more radical version of the objection was proposed by Edmund Sapir and Benjamin Lee Whorf. They extend it beyond interpersonal differences to differences between groups of people. Although the hypothesis that bears their names is the most influential one of its kind today, versions of cultural and linguistic relativisms were common in eighteenth- and nineteenth-century Germany. All such claims suggest it is only through the culturally acquired filter of language that humans divide the unarranged mess that is the world into the more orderly ontology it has in thought. That is, rather

\[\text{Footnote: For example, such views were espoused by Wilhelm Von Humbolt, Johann Georg Hamann, Johann Gottfried Herder; and to the list could be added such non-German's as Ernst Cassirer, and Peter Winch.}\]
than the world directly impressing itself on us, which is a belief often conjoined to the Uniformity Assumption, seeing is instead claimed to be an active event through which interpreted perceptions arise according to one’s language.\textsuperscript{48}

Most of the controversy has surrounded lexical or grammatical differences between languages and the effects these have on thought. Of the former sort Sapir writes,

Even comparatively simple acts of perception are very much more at the mercy of the social patterns called words than we might suppose. … We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation (p. 210).\textsuperscript{49}

In Whorf’s words,

We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds – and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way – an agreement that holds throughout our speech community and is codified in the patterns of our language … all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated.\textsuperscript{50}

Humbolt, like Whorf, was interested in what he sees as differences between levels of grammatical efficiency. Sanskrit, an inflectional language, is deemed nearest to ideal; Chinese, being isolating, is deemed furthest away.\textsuperscript{51} To explain these differences Humbolt posits differences in the “mental power of the nation.”\textsuperscript{52} But his claim is not

\textsuperscript{48} For Aristotle perception was an active event. He claims it could not be merely passive since it involves discrimination. However, since Aristotle also believes all humans discriminate in the same way, the active role he assigns to perception is different from that assigned to it by relativists of the sort we are considering.
\textsuperscript{49} Sapir 1929, 207-214.
\textsuperscript{50} Carroll and Whorf 1964, 212-14.
\textsuperscript{51} Inflectional languages modify lexemes to mark grammatical relations. Isolating languages are those in which almost every word consists of a single morpheme. English, German, and the romance languages are all more isolating than inflectional but are nevertheless exempted from ranking near the bottom since each is assumed to once have been more inflectional.
\textsuperscript{52} Quoted in (Harris and Taylor 1997, 179).
only that these “mental powers” influence language development; he also claims that once in place language can help or hinder one’s mental operations depending on the extent of its grammatical efficiency.

The problem with debates about linguistic relativism is the almost complete lack of empirical evidence on both sides. As Chris Swoyer observes,

Often the only evidence cited in favor of such hypotheses is to point to a difference between two languages and assert that it adds up to a difference in modes of thought. But this simply assumes what needs to be shown, namely that such linguistic differences give rise to cognitive differences. On the other hand, refutations of the hypothesis often target implausibly extreme versions of it or proceed as though refutations of it in one domain (e.g., color language and color cognition) show that it is false across the board.53

Our point in mentioning these relativities in relation to the Uniformity Assumption is not to settle, or even become engaged with, the issues surrounding them. That there are differences is clear. There are educational differences in the case of the neighbours, and there are linguistic differences in the cases mentioned by relativists. What is unclear is whether these amount to mental differences. The problem, we suggest, is not one of deciding what is the same and what is different, but of deciding what is the content of a thought and when two contents are the same. The solution is to go as far as we can in explaining relevant similarities and differences, and to set aside the type of talk which does not allow the distinctions we wish to draw, and which therefore leads to confused speculation.

Like alchemical terms, the language of ideas and minds may fade from use with the advent of new vocabularies that allow more fine-grained comparisons to be drawn. Just as talk of “salts” and “damps” gave way to a language in which more precise specifications could be made, so too might talk of ideas and thoughts be replaced. The problem of course is in developing new vocabularies. They need not, and generally do not, come of a piece however, and no one should expect or desire to overthrow a well established system at an instant. The required changes will most likely result from careful redescriptions not themselves reliant on the older vocabulary or its commitments.

53 See “Relativism” in (Zalta 2003).
In the case of our electrician, if we want to explain why the tools occasion in him the effects they do it is best to begin by telling the story of how those tools were developed and how he became engaged with them. This story should be about causal interactions and the changes they have undergone. Thus it should also be an evolutionary story, for the creation of those tools depended in part on the antecedent creations of tools in their ancestral line. The case is the same for language users. And rather than attempting to explain how thoughts gave rise to language or how language influences thought, we propose that it is a better course to tell a causal story of how early, pre-linguistic interactions gave rise to later ones and how various developmental stages are interrelated. This story can perhaps be told without talk of ideas and thoughts, and it should not presuppose anything about what is and has always been the same.

2.2.5 Me, myself before, and the I that will follow

The second objection claims that over the course of a lifetime individuals differ in ways that should lead us to reject the Uniformity Assumption. That there are differences should not require any explanation. To take an extreme example, the stages of being a newborn and a new mother are obviously very different. But defenders of the Uniformity Assumption may claim that babies are not meant to be compared with adults. We can grant them that, for other examples are equally easy to produce. Consider young lovers each overcome with physical desires upon catching sight of the other, who will see these feelings give way to others over the course of their life together.

Examples of this sort need not concern something as difficult to understand as love. Other difficult phenomena can be substituted for the harder of heart or differently inclined. For instance, most scientists and philosophers of science (not to suggest either could remain unimpressed with the previous example) admit that with new paradigms come new ways of thinking and seeing. The Copernican, Newtonian, and Einsteinian revolutions, through redefining the workings of the cosmos, the things in it, and the relativities of measuring, brought changes to the way we conceive of ourselves and our place in the world. One who lives and works in fields affected by these great men would be a likely host for the types of differences we are discussing.
Also, consider again the electrician from the last section. He and his neighbour are in a similar situation regarding the tools before he learns his trade. Thus, education creates differences, and any type will do. The magician who witnesses a trick she later learns sees it differently at both times, the carpenter sees houses differently before and after building one. A performer experiences a composition differently once she has mastered it, and so on.

That there are such differences seems unobjectionable. The problem involves deciding whether they count against the Uniformity Assumption. What place do such changes have in relation to “the essential nature of thought” or to the “natural endowments” (or lack thereof) each of us receives? The presence of change cannot be disputed: only its relation to a troublesome vocabulary. If the “essential nature of thought” does indeed remain the same, then it has little value in explaining the features that interest us. Learning language involves change, the processes of learning themselves change through time, and languages are constantly changing accordingly.

2.2.6 The case of the caveman

More common now than the view that humans have in all times been essentially the same is one suggesting that successive stages in the co-evolution of brain and language are likely to have been marked by significant differences. In the last section we noted some small scale differences regarding changes in a language and changes in a person learning language – i.e. the introduction of scientific terms and the acquisition of a professional vocabulary. Such examples can be dismissed as local or irrelevant by proponents of the Uniformity Assumption, but as time scales are stretched so that comparisons are drawn between us and our earliest ancestors, points of difference in the mental realm seem to outweigh points of similarity. We expect many will grant that the world is likely to occasion different interpreted perceptions in a painter and a physicist, and so we ask: what should stop them from granting that both differ to an even greater extent from their troglodyte forbears?

Accepting that there are such differences, the question becomes: Is a mentalistic vocabulary the best one for describing them? Our answer is no. Abandoning the
Uniformity Assumption only to say that "the essential nature of thought" changed through time is not a step forward. It leaves us on a superficial level. What is required is an explanation of the changes involved, and this should rely only on the detectable features traditionally assumed to be connected with thought, not on thought itself. Specifically, the focus should be on language.

A complete story of linguistic change would have to begin in what Entwhistle describes as "those charming ages when 50,000 years more or less made no difference."54 That is, it would explain how our earliest ancestors progressed from a state without language to one with it. To tell that story is not here our aim. However it is worth noting some of the required transitions if only to show that they lend themselves more easily to physiological and biological descriptions than to mentalistic ones.

Before examining specific changes, we should ask whether the changes required came together or developed more slowly. We assume the latter is more likely. Like Terrence Deacon we believe that "hopeful monster stories," i.e. those positing "a definite and dramatic transition from one stage to another in the evolutionary sequence,"55 are appealing insofar as they offer easily comprehensible accounts of language origins. But we agree also that this simplicity is bought at a price. The most plausible accounts of how other bodily processes (respiration, vision, etc.) evolved posit an accrual of distinct alterations with interrelated functional consequences. We assume that language developed together with other functionally related abilities and did so in uniform manner with them, not that a functionally discreet language organ was quickly appended.56

The slow evolutionary development we envisage is in fact difficult to describe in the language of thoughts. This is because mentalistic vocabulary typically does not admit of fine divisions. Particularly, it seems ill-fitted to explaining the changes our ancestors made from being noise makers to language users. The fumblings toward language assuredly passed through stages we would not now describe as being fully linguistic.

54 Entwhistle 1964, 16.
55 Deacon 1997, 36.
56 Cf. (Lieberman 1984, 379) for a proposal and defense of such an account. Regarding evidence, as Deacon also notes, many observations have been sited in support of a quick and complete transition. He mentions: abrupt technological transitions, possible punctuated speciation events, rapid population changes, and signs of major innovations in cultural artefacts. We agree that none of these is conclusive.
To describe these intermediary stages Derek Bickerton introduces the term ‘proto-language’. Whether languages ever had the features he attributes to proto-language is unimportant here. What matters is simply that in describing something as messy as language it seems a mistake to saddle oneself with a vocabulary intolerant of degrees.

Concerning required changes, we know that sufficiently far removed ancestors could not have produced the noises made today in speech. They were not physiologically able. Their voices would appear “breathy” to us and thus difficult to understand. To speak as we do required significant alterations of the vocal tract, specifically the elongation of the oral cavity, descent of the larynx, and alteration of the tongue. And at least equally necessary were neural developments for speech processing and for the rapid muscular control required in speech production. These changes can be related to other changes, and the list of required ones could be further expanded. However, our point is simply that the types of changes involved are better able to be described in a physiological or biological vocabulary, than in one that is mentalistic.

In sum the Uniformity Assumption is either unclear or false. Its prolonged support is probably due only to its lack of specificity. Once a sufficient degree of detail is reached it becomes obvious that change, not constancy, is the predominant feature of language. Moreover, the types of changes in question are better described in vocabularies other than that of the Uniformity Assumption. Thoughts in particular are not suited to explaining the inter- and intrapersonal differences we considered, nor for explaining the emergence or workings of language. These are questions most in need of answer, and in them thoughts must take a back seat.

2.3 The code model of communication

Before setting aside the traditional view about the relation between thoughts and language, along with our attack on the adequacy of its vocabulary, we should consider what Sperber and Wilson call “the code model of communication.” As traditionally conceived this is the view that communication involves a speaker’s encoding thoughts in language which is heard by another who decodes the language and thereby receives the

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57 See (Bickerton 1990).
thought. We aim to discredit this view. Our approach is first to challenge the encoding side then to challenge the decoding side. The first step involves arguing against the assumption that thoughts exist fully-formed in the mind prior to receiving linguistic expression. Without this assumption the traditional code model of communication flops. It also flops if there is more to understanding speech than just decoding, and this too we intend to show.

2.3.1 Encoding

In §1.8 we saw Saussure challenge the assumption that thoughts exist fully formed in the mind prior to receiving linguistic expression. Based on quotations collected by Aarsleff it is clear that the challenge was prefigured by at least Condillac and Diderot, both of whom claim that although a thought may be instantaneous in the mind it is only through speech that it becomes “linear”. Condillac claims, “If all of the ideas that compose a thought are simultaneous in the mind, they are successive in discourse: it is language that provides us with a means of analyzing our thoughts.” Diderot claims that “our mind is a moving picture from which we paint ceaselessly ... the mind does not go step by measured step like expression. The brush executes only in the process of time what the painter's eye embraces in a flash.” 

Each of these three men believes something is in the mind before receiving expression, but also that it is not yet fully-formed or lacks the structure provided by language. But what is that something, and is it the sort of thing that could get encoded? The words 'simultaneous', 'moving', and Saussure's 'chaotic' do not however take us very far toward understanding the nature of pre-linguistic thought. One aspect of Condillac’s claim does, however, indicate a widely held belief about thoughts, namely that they are composed of ideas. Although notions of ideas and thoughts vary, ideas are typically associated with words or phrases, and sentences offer the best match for thoughts. Indeed, just as most grammarians consider the sentence to be the minimal unit for complete semantic analysis, the traditional view of thoughts is that they are in some ways sentence-like.

58 Both quoted in (Aarsleff 1982, 157).
In speech, sentences typically last up to 5 or 6 seconds, a fact which can be understood in relation to human respiration. We speak only during the expiratory phase of the respiratory cycle, and 5 or 6 seconds is the amount of time we can speak while maintaining stable subglottal air pressure, a necessary feature if uncontrolled variation in pitch and amplitude is to be avoided. Regulating subglottal air pressure involves overriding vegetative breathing and this suggests it is a characteristic that has been selected for. Thus, the typical lengths of sentences seem explainable as a feature of our evolutionary history.\(^{59}\) Competing explanations in terms of thought size seem less plausible.

The claim we are considering is that thought exists prior to, and has a role in triggering, linguistic productions. A defender of this view might find consolation in Lieberman’s report that “the respiratory maneuvers that a speaker uses during normal discourse tend to be ‘preprogrammed’.”\(^{60}\) Evidence of this is seen in the fact that when preparing for the delivery of a long sentence a speaker will tend to take a larger inhalation than he will for the production of a shorter sentence. However, two things require explanation before considering this preprogramming as pre-linguistic thought that gets encoded in language.

First, speakers often make “production errors,” sentences are begun in which the speaker “runs out of air” before getting to their end. Lieberman gives the example of an excited child enumerating the animals at a zoo or the good things to eat at a party. Adults make similar “errors,” but they tend to stop in places which indicate that the sentence is not over, and may also mark ellipsis by intonational cues. Why should these types of cases arise if indeed thoughts are fully formed in the mind before receiving linguistic expression?

Second, and contrasting with running out of air is the experience of beginning a sentence without knowing how to end it. Most of our speaking experience is done without complete planning. We often find ourselves in the awkward position of having followed a grammatical path with unsure completions. We fall into the syntax of despair.

\(^{59}\) Lieberman 1984, ch. 5.
\(^{60}\) Lieberman 1984, 110.
Consider: "We should confiscate the automobiles of people who drive under suspension and they don't get it back and it's sold at auction." Although we usually find our way to the end of a sentence, introspective evidence suggests that these puzzlements over where linguistically to go next are the norm and not the exception. Cases of this sort conflict with the assumption that thoughts are fully formed and awaiting linguistic expression. They need to be explained if the assumption is to be maintained.

Again an evolutionary account suggests itself. We might expect that since the range of potential completions for a sentence decreases as the sentence progresses, it would be advantageous to devote a larger amount of preprogramming energy to a sentence's beginning than to its end. This hypothesis squares with the evidence but not with the assumption that a whole thought is initially present to be encoded.

Speech production is a physiological process, one that is becoming increasingly describable. "Preprogramming" is suggested as one of its features, and there seems little harm in calling this feature "thought". However, we should not expect from analysis of the word 'thought', either as traditionally used or as it might today be applied, much insight into the processes actually at work in the production and reception of speech.

Since it has little chance of offering insight and a great chance of extending confusion, the traditional idea that thoughts are fully formed and present in the mind prior to linguistic expressions should be abandoned. Indeed, as Firth explains, the notion of pure thought in abstraction from its expression is not one of the most useful figments of the learned world.

2.3.2 Decoding

The main challenge to the decoding side of the code model stems from the recognition that different utterances of the same sentence may, and often do differ in their interpretation. In many respects this observation is due to Grice. From it has spawned an entire sub-discipline, known as pragmatics, within the philosophy of language and linguistics. We assume a general knowledge with examples of the sort in question, and so

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61 John Bates in The Vancouver Sun (1996-10-24). Quoted in (Jennings, MS).
mention only a few (given by Sperber and Wilson) to show how they pose a problem for the code model of communication. Consider,

2.3.2a I’ll come to Vancouver B.C.

A speaker equipped with a rule such as

2.3.2b Substitute for ‘I’ a reference to the speaker.

could decode that the person speaking is speaking about themselves coming to Vancouver B.C. But cases quickly get more difficult. Consider,

2.3.3c That’s interesting.

As Sperber and Wilson remark,

It presumably follows from the grammar of English that the referent of … ‘that’ must be non-human. However, … on virtually every occasion of utterance, there is more than one referent meeting these conditions. The assignment of actual referents in these cases must clearly involve something much more complicated than rules [such as 2.3.2b].

They go on to argue that comprehension is an inferential, not a decoding, process.

Even for the simplest examples such as those considered here, the rules for successful decoding seem unfeasibly complex. A more plausible explanation suggests that features of the environment (both non-linguistic, and linguistic, such as the manner of utterance and its relation to previous linguistic features) and of past experience are exploited so as sometimes to occasion non-typical effects.

2.4 Beyond talk of ideas

2.4.1 The road ahead

Having completed our examination of the traditional view of the mind and its relation to language we turn to more modern developments. Like the innovators considered in this section we set aside our worries about talk of thoughts and begin examining new ways of talking. The move away from mentalistic vocabulary began long ago and in tracing its

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62 Sperber and Wilson 1986, 12.
steps we shall follow what Quine describes as points where empiricism has taken a turn for the better.

He writes, "The first is the shift from ideas to words. The second is the shift of semantic focus from terms to sentences." The third, for us, is what Quine calls "methodological monism," and although by this he meant abandoning the analytic-synthetic distinction, he would probably not object to our appropriation of the term to signal a shift from viewing language as something to be semantically analyzed to viewing as a collection of physical interactions with a physical history capable of investigation.

2.4.2 Ideas to words

The move from talking of ideas to talking of words is said by Quine to have originated with Horne Tooke. In fact, Quine credits Tooke with effecting two decisive changes in the reorientation of empiricism: "first, the philosophical shift of focus from idea to word; second, the linguistic fact that the words in sharpest focus are mainly words for external objects." Both of Tooke's achievements came largely in response to Locke.

Tooke, like most other philosophers of his time, was greatly influenced by Locke and with him agrees that the purpose of communication is the conveyance of thought. However, on a related point he disagrees: Tooke does not share Locke's opinion that for each complex term there was a corresponding complex idea. Instead he suggests that the compounding of ideas is a feature of language alone. The mind, for Tooke, contains only simple ideas, and it is the role of language to communicate these.

While Tooke believes it is in principle possible to communicate by means of words corresponding to simple ideas alone anything communicable in other ways, he claims it would take an inordinate amount of time to do so. Therefore he suggests that, through a process he calls abbreviation, a class of words is created which stands, not for ideas but for other words or groups of words. Thus is the need for "despatch" achieved. Where Locke sees an imperfect system of communication Tooke saw a perfect model of efficiency. He claims that because the principle of abbreviation had been overlooked,

63 Quine 1981, 67.
64 Quine 1970, 4.
attempts to map words with ideas were destined to fail: there simply are no ideas to which many words correspond. Nevertheless, according to Tooke much of what Locke says about ideas can rightly be applied to words. Thus his famous appeal:

I only desire you to read the Essay over again with attention, and see whether all that its immortal author has justly concluded will not hold equally true and clear, if you substitute the composition, &c. of terms wherever he has supposed a composition, &c. of ideas. And if that shall appear to you to be the case, you will need no other argument against the composition of ideas .... Every purpose for which the composition of Ideas was imagined being more easily and naturally answered by the composition of Terms: whilst at the same time it does likewise clear up many difficulties in which the supposed composition of Ideas necessarily involves us.  

In taking an interest specifically in what he calls conjunctions, Tooke not only shifted emphasis from ideas to words, but shifted it toward words that were themselves previously largely ignored, and indeed ones that have continued to evade philosophical attention. What we today call functional vocabulary is often taken for granted as a stable component of language, one less complicated than its lexical relatives. In fact, far from being the most secure and least troublesome aspect of language functional vocabulary appears to be the most fragile and least widely understood.

2.4.3 Words to sentences

Quine attributes credit for the second step in his series to Bentham, for with Bentham originated contextual, or as he called them paraphrastic, definitions.

A word may be said to be expounded by paraphrases, when not that word alone is translated into other words, but some whole sentence, of which it is part.  

The importance of the move from terms to sentences becomes especially evident in relation to functional terms, for these have linguistic significance only as parts of sentences. Thus, the problem Tooke saw arising for Locke’s position, namely the lack of ideas to which what he called conjunctions might be traced and thereby grounded in

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65 Tooke 1968, 38.
66 Bentham 1962, Vol.1, note 6, 293.
sensory experience, can be set aside once it is accepted that no definition outside of sentential environments can be expected for these terms.

2.4.4 Sentences to behavior

Though Quine did not explicitly rank behaviorism in his list of “turns for the better” he did assume it represented “philosophical progress in language theory.”\(^{67}\) Not all are of this opinion. Many feel behaviorism was a misguided theoretical framework for studying language, one that Chomsky put to rest in his review of B.F. Skinner’s *Verbal Behavior*. Chomsky famously objected that, despite being “one of the most careful and thoroughgoing presentations of such [behaviorist] speculations”\(^{68}\) on language use, Skinner’s research in *Verbal Behavior* and his project generally were destined to fall short of adequately explaining language since both neglected the “contribution of the organism,” something Chomsky claims is an essential component. That debate is not one we wish to enter, but we should note that although the behaviorist paradigm is now more a matter of historical interest than a promising theoretical approach, and although its associated limits of focusing only on macro input-output relations have given way to more fine-grained neural investigations, the demise of behaviorism was not so much a victory for those lauding mentalistic vocabulary as it was for approaches based on detailed physiological investigation.

2.4.5 Behavior to brains

Many of the recent discoveries made regarding speech processing, both production and reception, have come through examinations of the brain. With the application of Functional Magnetic Resonance Imaging and of Positron Emission Tomography technologies it became possible to map dynamically changes in the brains of people as they speak, read, or listen to language. This in turn permitted detailed analysis of the areas of the brain most active in language use.

Studies of functional deficits in patients who have suffered traumas such as strokes or other cerebral injuries are at least a century old, but with the development of

\(^{67}\) Quine 1970, 5.

\(^{68}\) See preface to (Chomsky 1959).
new technologies new challenges are being presented to old characterizations. These
debates, the discoveries producing them, and the technologies involved are still capable
of only rather crude description, but none doubts that the brain is the seat of language, nor
that investigation of the brain are likely to offer great insights regarding language. Thus,
one requirement of adequacy for a theory of language should be that its claims admit of
comparison or integration with other physical theories of the brain.
3 A NEGLLECTED DIMENSION

3.1 À la recherche du temps perdu

Synchronic linguistics is concerned with instants, diachronic with the moments in between. Partly because he was first to draw this sharp divide Saussure is sometimes called "the father of modern linguistics." The title's lasting fit has been assured by the ensuing backlash, which still persists, against pre-twentieth century historical approaches to language. Lest it be assumed, let us immediately say that our aim is not to stake out for etymology or for cultural-linguistic comparisons a preferred philosophical plot. Nor is it to discredit the worth of recent, so-called synchronic studies of language. We do argue however that the decision not to look beyond very short and recent timeframes deprives us of some of the most useful tools available for explaining the physical significance of linguistic events.

We want to explain both generally and for particular cases why linguistic productions reliably occasion the effects they do. This is the problem we assume talk of "meanings" and "conventions" is introduced to answer. The received philosophical view is that a competent speaker of English owes her understanding of a given sentence to the knowledge she has of the meanings of its parts and of the rules by which they may be combined. Meanings and rules, the story goes on to say, are established by convention.

There is something obviously right in this, but it is unsatisfying simply to take convention as a basic postulate not itself in need of explanation. It is equally unsatisfying to explicate 'convention' in the terms it was itself introduced to explain.69 The word 'convention' is in fact an odd choice, suggesting as it does an organized meeting of delegates. None but a negligible few words have had their meanings "established by convention" in this sense, and although teaching explicitly formulated grammatical rules is a worthy educational aim, these rules represent non-essential finishing touches to pupils’ already well-developed linguistic abilities.

69 Cf. §2.2.2.
Aristotle’s choice of ‘thesis’ comes closer to characterizing what we assume is the key feature in question, namely that the purely physical characteristics of spoken language and its graphic representation bear no systematic or necessary relation to the effects by which they are prompted and to which they give rise. The same point is made by saying that any system of utterable phonemic streams or inscriptional complexes might have worked as well as any other for the general purposes to which language is put. This arbitrariness may be conceded, and evidence of it can be seen in the great diversity among human languages. Nonetheless, we contend that if convention cannot be accounted for in physical terms it is otiose in a theory of language.

Language is inescapably biological; so if it is also inescapably conventional, then convention must be physically characterizable. The critical question for us then is: what, in physical terms, constitutes what we call the conventionality of language? A preliminary answer is that, like the language of “function” in biology, talk of conventionality serves as a convenient shorthand for higher-order explanations. We outline some features of such higher-order explanation as it applies to language, and since such an explanation requires a temporal component we argue in favor of this currently neglected dimension. Duration is an aspect of language that should not be lost; rather than rest content with “temps perdu” we argue for “temps reconquis”. When the temporal aspect is regained, language properly can be seen as an evolved species in the sense we define. Also, broadening timescales beyond the instantaneous allows us to begin articulating the methods by which new physical significance of linguistic productions emerges from earlier ones. Without diachronicity there can be no notice of change, and change is a fundamental feature of language. Some examples taken from Jennings’ research into English functional vocabulary are reviewed by way of illustration.

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70 However, see §4.5 for further discussion.
3.2 Where and when is language?

Both synchronic and diachronic studies presume there is something called language that is capturable at an instant. But as Chomsky remarks, “It is a striking fact that despite the constant reliance on some notion of ‘community language’ or ‘abstract language,’ there is virtually no attempt to explain what it might be.”

That there have been few attempts to delimit language from non-language, or even to delimit languages precisely from each other, is not particularly striking to us. The task is difficult and the lack of specificity has not proven problematic. Each of us is able to tell reliably when someone is speaking a language, even when they are speaking one we do not know. Faking language is difficult and all but the most exceptional frauds are quickly recognized.

There are however many borderline cases for which it is difficult to decide whether what is being produced belongs to a language proper or some close relative. Obvious difficulties surround those noises made during various stages of our ancestral transition between pre-, proto-, and proper language, but even excepting these it remains easy to find examples. For instance, consider Carroll’s Jabberwocky and Joyce’s neologizing twirls; or consider pidgin languages and ask how these are to be precisely divided from their more proper parents and from their creole progenies; or consider formal and technical languages, which span a wide range indeed and include everything from logics to codes for sweater knitting or replaying chess matches, perhaps also the languages in which the laws of one’s land are written. Each of these cases, and the list could easily be expanded, pose problems for anyone hoping to segregate languages precisely.

71 See Noam Chomsky’s “Mental Constructions and Social Reality” in (Reuland and Abraham 1993, 39).
72 Of course there have been many appeals that foreign influences (and in monolingual cases that inadequate educational standards) are degrading some perceived purity in the language for which the appeal is made. These conservative complaints have rarely been influentially heeded however and they are decreasing to a point of near extinction today.
3.2.1 Saussure’s synchronic/diachronic distinction

When Saussure distinguished synchronic from diachronic approaches to linguistics, a distinction also sometimes introduced to oppose static and evolutionary linguistics, he was explicit about their subject matter. Language for Saussure is “a system of pure values which are determined by the arrangement of its terms.”\(^{73}\) ‘Value’ (valeur) is used to represent the totality of relations into which a given sign enters with other signs of the same language. Thus language is a system by which words (and perhaps word patterns) are interrelated. This system is not purely abstract; it is physically instantiated in the brains of its speakers. Sounds and concepts join together to comprise signs, and linguistic signs, “though basically psychological, are not abstractions . . . [they] are realities which have their seat in the brain.”\(^{74}\) Elsewhere he writes,

> Language exists in the form of impressions deposited in the brain of each member of the community, almost like a dictionary of which identical copies have been distributed to each individual. Language exists in each individual but is common to all. Nor is it affected by the will of the depositaries. It’s mode of existence is expressed by the formula: \(1 + 1 + 1 + 1 = I\) (collective pattern).\(^{75}\)

While this view allows one to consider language at an instant it is implausible insofar as it glosses too quickly over important differences. The referents for the 1’s of the formula – my neighbor and me, a coal miner and a queen – are not well represented by the same numeral. It is not Saussure’s insistence that language is instantiated in the brains of its speakers that we find objectionable. That seems roughly correct. What we object to is only the lack of detail, for as expressed, his formula suggests that each of us contributes to the whole in the same manner and to the same degree.

3.2.2 An alternative

Let us start small with a single element of speech. On every instance of its utterance it will be uniquely neurally realized in its speaker and in those apprehending what she says. Its success in occasioning predictable effects therefore depends on discriminatory

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\(^{73}\) Saussure 1965, 80.
\(^{74}\) Saussure 1965, 15.
\(^{75}\) Saussure 1965, 19.
capacities and incapacities. To the hearers at least some portion of the element must be familiar, and ideally it will be recognized entirely.\textsuperscript{76} That is, hearers must have the positive capacity to distinguish that particular element from ones belonging to other linguistic types. But doing this involves discriminatory incapacities as well. For instance, each of us has at least subtly different manners of pronunciation which to some extent must go unnoticed. When non-Scots see a Scottish film, its beginning and end are separated by a qualitative scale of relative ease of understanding. Learning not to notice the differences of pronunciation, to just hear the language as one's own, takes time; the more time given it, the easier it becomes.

Introducing a temporal aspect allows us to note that "any neural systems figuring in episodic apprehensions of speech and inscription must also change dynamically throughout the ontogeny of the linguistic agent."\textsuperscript{77} Understanding these histories of change, both personal and collective, is relevant to determining or predicting the types of effects likely to be occasioned by linguistic productions. Consider the following example of "cockney rhyming slang":

Got to my mickey, found me way up the apples, put on me whistle and the bloody dog went. It was me trouble telling me to fetch the teapots.\textsuperscript{78}

To understand why this linguistic production evokes empathy from some and creates confusion in others it will be helpful to know what types of linguistic practices its hearers have encountered. Geographical specifications are helpful in this regard, but they are not alone sufficient. The stories required must be also temporal for two reasons: first because the ontogenic development of the individual hearer is relevant, and second because the evolutionary history of ontogenic developments preceding that of the hearer in question is also relevant. For both types of stories instants are too short a time.

\textsuperscript{76} The qualification "some part" is added to capture our ability to extend interpretive results beyond known applications. For example, although the word 'kidapult' is likely unfamiliar we might expect parents to be reluctant to allow their children on a ride by the same name given the known effects of 'kid' and 'catapult'.

\textsuperscript{77} Jennings and Sinclair, MS.

\textsuperscript{78} Translation: Got to my house (mickey mouse), found my way up the stairs (apples and pears), put on my suit (whistle and flute) when the phone (dog and bone) rang. It was my wife (trouble and strife) telling me to get the kids (teapot lids). Anonymous 2005.
Another type of example to be accounted for includes: “The unexamined life is not worth loathing”; and “Now you’re cooking with camel dung.” To explain why the first gets interpreted (by some) as a comic rebuke of philosophy and why the second conveys that things are being done at less than maximum efficiency requires expanding timeframes past the current instant. A decent explanation should mention English translations of Plato or American advertisements for appliances. Furthermore, understanding how the component words themselves have come to have the effects they do requires still longer timescales.

Thus rather than separating fields interested in instants from those that examine the moments in between, the only plausible distinction to drawn if one’s goal is explaining the physical significance of linguistic expressions is one that separates greater and lesser timeframes of analysis. Some expressions will require only short-term analyses, such as an anaphoric ‘he’ co-referential with a ‘man’ introduced in a preceding sentence; others will require longer timeframes, such as those in the examples given above. Within linguistics departments, interest in dynamic semantics is currently developing and this has expanded the timeframes of interest to about conversation length. We see this as a step forward, but explanations of the physical significance of linguistic productions requires expanding our perspectives to include longer histories.

3.3 Language as evolved species

Another reason for thinking Saussure’s formulaic definition of language is implausible is that it takes language as a complete system; an “I” made up of “I’s”. In fact, language does not admit of such precise delimitation and to import precision is only to distort its actual bounds. As J. A. H. Murray eloquently explains,

> The vocabulary of a widely diffused and highly cultivated living language is not a fixed quantity circumscribed by definite limits. That vast aggregate of words and phrases which constitute the Vocabulary of English-speaking men presents, to the mind that endeavours to grasp it as a definite whole, the aspect of one of those nebulous masses familiar to the astronomer, in which a clear and unmistakable nucleus shades off on all sides, through zones of brightness, to a dim marginal film that seems to end nowhere, but to lose itself imperceptibly in the surrounding darkness. In its constitution it might be compared to one of those natural groups of
the zoologist or botanist, wherein typical species forming the characteristic nucleus of the order, are linked on every side to other species, in which the typical character is less and less distinctly apparent, till it fades away in an outer fringe of aberrant forms, which merge imperceptibly in various surrounding orders, and whose own position is uncertain.79

We agree with Murray that a language is in many ways like those natural groups of the zoologist or botanist. Further, we believe that parallel methods of explanation are appropriate. In evolutionary biological explanations, parts that bear the label ‘functional’ have the physical significance that they have

(a) because ancestral parts of ancestors had the physical significance that they had, and

(b) because of the manner in which the one significance gave way to the other.

Properly understood, human language shares these more general biological features. Linguistic interventions have the physical significance that they have

(a) because ancestral linguistic interventions of ancestral linguistic communities had the physical significance they have had, and

(b) because of the manner in which earlier linguistic significance engenders later linguistic significance.

In large part the physical significance of a linguistic intervention will be neurologically realized. Adequately typing the neurological events involved may yet be a long way off, but no matter how it is done we can be sure that the types involved shall constitute species according to the following definition of that term:

A species is a union of populations temporally ordered monotonically by an engendering relation. (That is, earlier populations engender later populations.)80

In our ordinary use of the language of species, they are also temporally indexed. That is, we identify a species by its current population. By defining ‘species’ so that it is non-

80 S is a species iff \( \exists P, \exists T, \exists R, : P = \{ p_i | i \in I \} \& T = \{ t_i | i \in I \} \& S = \cup P \& (i,j, R p_i p_j \Rightarrow t_i \leq t_j \) (where P is a set of populations indexed by I, T is an ordered set of times indexed by I, and R is an engendering relation).
trivially temporally indexed, we accommodate the fact that every population is at least minutely different both from its predecessor and from its successor. We also accommodate the concordant fact that sufficiently far removed ancestral populations are not themselves members of the species indexed at the later time. Nearly all such species have the feature of being evolved according to the following definition:

A species is evolved iff the characteristic function of the closure of the set of its populations under its engendered-by relation is non-trivial, and temporally monotonic. (That is, in the ancestral of its engendering relation we will find populations that are to some non-zero degree within, and to some non-zero degree outside of the species, and in general, no properly later population is “less” a subset of the indexed species than any properly earlier population.)

These definitions should make clear that the language of species and evolution is not being used as a vague metaphor. Neither is such language intended to invite associations not explicitly warranted by the definitions given. We do not suggest that study of language trades upon some analogy with the phenomena of organic evolution, nor do we wish to be allied with those making such claims, particularly with those nineteenth century linguistic vitalists who used a descriptive language similar in sound and shape (but not definition) to our own.

3.4 Linguistic engendering

Condillac, and to some extent Aristotle, proposed that language develops by “analogy”. The underlying idea seems correct to the extent that it is clear. Since ‘analogy’ merely connotes some vague agreement, we want to replace that term here with the more accurate ‘engendering’ which suggests a filial and derivative relation. With humans, progeny produced are often unplanned. In many ways they are unlike their parents, and to a greater extent they are unlike their parents’ parents. So too with terms engendered.

Pushing the metaphor further we can say that just as humans have recessive genetic traits so too do linguistic terms. For instance, pronunciations are recessive in the sense of

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81 $S$ is evolved iff $S = \bigcup P$ & $\exists p: 0 < (p, \text{CIR}(P)) < 1$ & $\forall i,j \in I, (p, \text{CIR}(P)) \leq (p_i, \text{CIR}(P)) \Rightarrow ti \leq tj$. 

49
being highly subject to change. This is especially evident because languages of the ear change more rapidly than those of the eye. Thus, witness ‘gh’. As Burgess explains:

The digraph ‘gh’ is a memorial to a departed /x/ - the unvoiced velar fricative as in ‘loch’ or ‘Bach’. ‘Light’, ‘bright’, and the rest retain an unvoiced semi-vowel (/q/) in their Scots pronunciation (‘It’s a braw bricht moonlicht nicht’) but the ‘gh’ in now merely an indicator of diphthongisation in ‘light’ and ‘bright’ and of length in ‘taught’, ‘caught’, ‘brought’. In ‘laugh’ and ‘cough’ it means /f/, and in ‘hiccough’, by a mistaken analogy with ‘cough’, it disguises a /p/.

The story of linguistic changes is one filled with mistaken analogies of the sort Burgess mentions. To be sure, mistransmission exerts a major influence on engendering. Consider the consonant shift that affected a numpire and a napron. Or witness how in Canadian English draw up has become drop, with the result that in discussing the timing of an election parliamentary commentators speak of the Prime Minister’s dropping the writ, and news readers announce that he or she has finally dropped it.

Often change involves the exploitation of incidental effects. This is evidenced by research on functional vocabulary. Once the process is noticed and sought, however, it becomes clear that its application is not limited to this domain. Reviewing some of Jennings’ findings will help to illustrate some wider applications of the notion of such exploitation.

3.4.1 Schematization

We consider two types of schematizations: those from spatial and temporal origins. Regarding the first, Jennings writes that “Much of the logical connective vocabulary of natural language is descendent from ancestral vocabulary whose explication would require mention of spatial relationships, and much of that same connective vocabulary have existent homonymic cousins carrying on in much the original family business and others in related branches of the trade.” The word ‘but’ is an example, and its original

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82 Burgess 1992, 88.
83 Jennings, MS, 4.
family business is claimed to be kept up by a “homographic Scottish cousin labouring as an adjective meaning physically outside.”  

Consider, 

3.3a It cannot be brought But, that is not the Ben.  

and,  

3.3b Gae but, and wait while I am ready.  

As the operational extension of such vocabulary increases, its capacity to occasion, specifically spatial effects depends increasingly upon contextual reinforcement. Uses such as ‘no one but the council …’ are licensed and successful. Thus clearly spatial uses gave way to more schematized ones. For example, that of categorial outsideness:  

3.3c nothing was to be seen but waggons and carts, with goods, women, servants, children, &c.  

and that of circumstantial outsideness:  

3.3d He glowered round upon us with a look of such concentrated ferocity that, but for our being forewarned as to the German method of comic singing, we should have been nervous.  

3.3d1 I would not have trusted him but that he brought a note from my brother.  

Though the last use is still prepositional, an ellipsis of that yields a completely logicalized stage in which it has the role of connective: 

3.3e It never rains but it pours  

where ‘but’ is disjunctive. The ellipsis also permits misreadings of syntax, so that a long-scope disjunctive but can, in many constructions, be read with practically undiscoverable change as a short-scope conjunctive connective. Accordingly, as most introductory logic texts instruct, the once spatial ‘but’ may now be treated as a logical ‘and’. As Jennings notices, the transition is so nearly complete that “outside of Scotland, such a remark as  

84 Jennings, MS, 4.  
85 OED, Oxford University Press 2000.  
86 OED, Oxford University Press 2000.  
87 Defoe 2000, 16.  
'there is no one but the house' would seem a curious, perhaps precious, personalization, if not the result of a selection error.”

As example of a word that has ceased to evoke temporal associations Jennings considers (among others) the word ‘once’. He observes the following uses. The inceptive ‘once’ of,

3.3f Once there I shall so advance, with the assistance I shall there get, that my present knowledge will appear to me but as childish ignorance.

and the bare temporal ‘once’ of,

3.3g They may once have been animals; but I never before saw an animal trying to think.

Both of these uses are suggested as cousins to the cardinal adverb of:

3.3h I scarcely know the Bishop; I've only spoken to him once.

The question in need of answer is: How does inceptive ‘once’, which, as evidently as ‘if’ deserves to be regarded as logical vocabulary, come by the authority it wields as a propositional conditional connective in:

3.3j Once people think you’re bad, you might as well be bad.

By way of partial answer Jennings offers the following:

It is tempting to imagine an origination live metaphor, in which vocabulary with a well established physical use was put to arrestingly novel non-physical use, a metaphor that in the course of time has lost the luster of new coinage, perhaps even outlived its physical progenitor. Perhaps it is safe to suppose that some of our logical vocabulary owes its logical meaning to some such episodes, but it would be wrong to suppose that all logical connectives that have or have had physical uses must be products of overt metaphorical figuration. For some such connectives there may be no first use in its non-physical role. For others, their propositional uses may have originated in incorrect, or crude, or lazy, or ignorant practice. They may have gained currency among speakers whose understanding was impervious to such distinctions, and may have been

89 Jennings, MS, 4.
90 Hardy 1965, Ch. 6.
91 Wells 2004, 129.
92 Saki 1911, 53.
understood only with difficulty by speakers who did understand. It would certainly be wrong to suppose that all, or even many speakers, are consciously aware that their utterances of connective vocabulary can be sorted into physical and logical instances.93

3.4.2 Grammaticalization

A similar migratory effect to those of ‘but’ and ‘once’ can be seen in cases of grammaticalization, a process whereby incidental effects are exploited, isolated, and refined. For instance, compare the ‘go’ of

3.5a I’m going to visit Aunt Sally.

with the progressive future tense ‘go’ of

3.5b I’m going to stand still.

Jennings proposes that this transition could not have occurred “if the first use did not incidentally give generally reliable grounds for the anticipation of whatever was the end of motion.”94

3.4.3 Trivialization

‘Trivialization’ is a term for “the emergence of a bivalent meaning of a linguistic element that previously has had only multivalent meanings.”95 In a similar manner to the grammaticalization of ‘going to’, we see ‘as well as’ undergo trivialization. Compare:

3.5c He was no prude and could laugh as well as anyone at the witty immorality of a farce at the Palais Royal.96

which is a persisting smoothly-valued use reporting comparable ability, with the discretely valued conjunctive use in

3.5d He had a great deal of work to do, since in the summer he was taking chemistry as well as the two examinations he had failed in.97

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93 Jennings, MS, 8.
94 Jennings 2002, 5.
95 Jennings , MS, 21.
96 Maugham 1936, 86.
97 Maugham 1936, 283.
This pattern of trivialization to be widely repeated. For it gives the following characterization:

1. α-use of vocable-string $S$ has main effect, $e$ and (among others) an unavoidable subsidiary effect, $e'$

2. $S$ is used in circumstances that nullify effect $e$, but not $e'$

3. $S$ acquires a prosodic or other variant $\beta$-use, $S'$ which has effect $e'$ but not $e$, even when circumstances would not nullify $e$.

So, for example, once stage (3) is reached

3.5e I expect to eat my peas as well as my baby carrots

may receive a discretely valued conjunctive reading even when the feat is to be attempted with chopsticks.

### 3.5 Higher-order explanations of language

The examples in §§3.3-3.5 illustrate some features of the engendering relation, especially the exploitation of incidental effects for occasioning novel ones. However,

it is well to bear in mind that the engendering relation of recent linguistic developments, understood as a physical process, is itself evolved from earlier engendering relations, in earlier, more primitive ancestors of present languages, and ultimately from engendering relations over non-linguistic populations of neural effects. Of these more distant developments, we can theorize, but either with less confidence or with less concreteness as the significance of fragmentary written evidence becomes obscured. Evolution is itself evolving.\(^99\)

We can represent these changes diagrammatically as follows,

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\(^{98}\) Jennings, MS, 6.

\(^{99}\) See (Jennings and Sinclair, MS).
where the ovals on the left represent linguistic interventions and those on the right their effects. The primes indicate that the interventions and their effects change through time. Over relatively short periods the changes will be minute, over long ones they will be relatively large. Solid arrows represent the causal relation linking an event to its effect. Hollow arrows represent exploitation of earlier causal relations by later interventions. The leftmost arrow indicates that the manner of exploitation of earlier causal relations is itself changing. This is a very local representation of the claim that evolution itself evolves. So does the manner of its evolving, and so on.

Though we may assume that the hierarchy is well founded, the assignment of orders is a dictate of interests. Here the relations between linguistic intervention and its effect are taken to occur at the first or base order. Changes in these effects occur at the second order. The leftmost arrow is that of highest order in our picture, though still higher ones are conceivable. While it is important that changes connecting a linguistic intervention to its effect be predictable and capable of exploitation, it would be a mistake to think the changes at higher levels are always, or even often, so. More plausible is the assumption that they occur gradually and generally elude notice.

New and old uses, when coexisting, often come to be distinguished by certain features such as positional markings (she has been hardly used vs. she has hardly been used); intonational stress (no trees have FALLEN OVER here vs. no trees have fallen OVER HERE); linguistic environments (going to visit vs. going to stay), linguistic markers (even, just), among others.
Thus, a theory of language must take into account more than what is typically orthographically represented. Particularly, such things as stress, intonation, accent, and emphasis cannot be ignored any more than can sentential negations. Also, what Firth calls the “context of situation” is equally important. As he explains, “In any context of situation, the normal human being and his environment are one; the past merges in the present in which the future is always on the point of being born.”100 This temporal aspect, we have been arguing, is essential to understanding language. Over conversation-length periods, short-term memory is required to disambiguate linguistic productions, as it is for anaphora. More subtle effects require longer timeframes for their explication.

We adopt a varyingly diachronic perspective because we see no other way of explaining why linguistic expressions occasion the effects they do. As we have argued in §2.1.1, accounts that offer explanations of these facts in terms of meanings or truth-conditions cannot succeed unless these explanans are themselves causally grounded. One way of answering the question about what, in physical terms, constitutes what we call the conventionality of language, is to suggest this is merely the causal histories of the causal relations that link a linguistic intervention to its effects. Thus the language of convention assumes a mere conversational role in the study of language akin to the conversational role of the language of function in biology more generally, that as a convenient shorthand for higher-order explanations.

100 Firth and Firth 1964, 20.
4  THE GRICEAN ENIGMA

4.1  The approach

Grice may be forgiven for being less that ideally explicit in distinguishing natural from non-natural meaning. His interests lay entirely on one side of the distinction. Natural meaning was an artless acquaintance, worthy of a polite nod but not worth crossing the street to engage. In setting out the division, Grice was aware that he was joining a long standing philosophical discussion; indeed he thought his own version of the distinction improved on those that came before. We disagree. We see Grice’s brief remarks as a muddying of previously clearer waters. However, the pre-Gricean account had remained almost undisturbed since Aristotle: linguistic meaning is, in some degree, conventional. None challenged this view, and by its means, natural could be distinguished from non-natural meaning with the same degree of precision as language could be distinguished from non-language. Disputes, when they arose, were about whether convention is itself something naturally developed. But with the decline of historical linguistics these debates and those more generally concerning nature vs. convention fell from philosophic notice. In reviving interest in the distinction and basing it upon criteria that are themselves no clearer than the concept of language itself, Grice neither contributed to the traditional disputes nor provided a better formulation of the distinction.

We begin this chapter by explaining why the relation between natural and non-natural meaning is important to Grice. From there we retrace the lines along which he contrasts the two sorts of meaning and review the “one or two recognition tests” he offers for distinguishing them. We explain the inadequacy of these criteria and of Grice’s reasons for preferring his own formulation to antecedent ones. Finally we rank-order the terms commonly used for expressing the distinction. By our measure Grice’s choices rank lowest.
4.2 The spoils Grice augurs

Grice estimates the potential rewards of comparing natural and non-natural meaning:

I see some grounds for hoping that, by paying special attention to the relation between non-natural and natural meaning, one might be able not only to reach a simplified account of utterer's occasion-meaning but also to show that any human institution, the function of which is to provide artificial substitutes for natural signs, must embody, as its key-concept, a concept possessing approximately the features which I ascribe to the concept of utterer's occasion-meaning.\(^{101}\)

The rewards are thus of two types: those related to demonstrating the importance of utterer's occasion-meaning, and those related to arriving at a simplified version of that concept. Rewards of either type are not ones we are particularly concerned to garner but their value to others, most importantly to Grice, is apparent.

An understanding of utterer's occasion-meaning, it emerges, is essential to an understanding of the anticipated rewards. It is a pity, therefore, that although (or perhaps because intricate discussions of the notion abound) no one formulation has won general acceptance. Now our aim is neither to simplify nor ultimately make use of the concept; we cheerfully concede to the task of saying what it is. Stephen Neale takes “something like the following” as the characterization of utterer's occasion meaning that emerges from Grice's Studies:

By uttering \(x\), \(U\) meant that \(p\) iff for some audience \(A\),

(1) \(U\) uttered \(x\) intending \(A\) actively to entertain the thought that \(p\) (or the thought that \(U\) believes that \(p\))

(2) \(U\) uttered \(x\) intending \(A\) to recognize that \(U\) intends \(A\) actively to entertain the thought that \(p\)

(3) \(U\) does not intend \(A\) to be deceived about \(U''s\) intentions (1) and (2).\(^{102}\)

Must every human institution the function of which is to provide artificial substitutes for natural signs embody a concept possessing approximately these features? The sticking point is (2). Consider road signs. Their effectiveness does not depend upon having their

\(^{101}\) Grice 1989, 116.

designers' intentions recognized. They need only to trigger types of responses that avert particular potential dangers. It is better that we should not, at that moment, be contemplating sign designers or their intentions, and thus there is every reason to suppose that their job's key concept involves assuming that we do not.

Certainly a simplified account of the concept of utterer's occasion-meaning would be desirable for the Gricean project. The complex intentions currently involved in the formulation are notoriously troublesome. Moreover, the importance of such a simplified account can be emphasized by considering the following picture taken from Neale:

*Figure 2: Grice’s Explanatory Hierarchy*

![Diagram of Grice's Explanatory Hierarchy](image)

Here "α → β" is understood as "α (or its analysis) plays a role in the analysis of β (but not vice versa)"^103^ Thus it is ultimately in terms of utterer's occasion-meaning that Grice intends to analyze or explicate all other forms of meaning. How this basic concept is to be simplified through consideration of the relation between natural and non-natural meaning remains a mystery. Except for this assurance that it might somehow be done, Grice's writings are mum on the subject.

Neither reward is easily attainable. Demonstrating the importance of utterer's occasion-meaning fails of plausibility because most cases are like that of the road sign: elaborate requirements of second order intentions on the parts of speakers are belied by the automatic and spontaneous character of speech. The biologer might add that we have

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^103^ Neale 1992, 543.
no theoretically useful understanding even of first order intentions. However, although we are given no explanation of how, by considering natural and non-natural meaning, we could arrive at a simplified account of utterer’s occasion-meaning, this is not to deny that Grice’s distinction between natural and non-natural meaning is not worth examining.

4.3 The distinguishing features

4.3.1 Five lines of comparison

The terms “natural meaning” and “non-natural meaning” were introduced in Grice’s 1957 article “Meaning”, which Grice begins with the following illustrative examples:

(1) Those spots mean (meant) measles.

(2) Those spots didn’t mean anything to me, but to the doctor they meant measles.

(3) The recent budget means that we shall have a hard year.

(4) Those three rings on the bell (of the bus) mean that the bus is full.

(5) That remark, ‘Smith couldn’t get on without his trouble and strife,’ meant that Smith found his wife indispensable.

Of these (1)-(3) represent natural meaning; (4) and (5) nonnatural meaning. Grice contrasts the examples along five lines as summarized in the table below:
Table 1  Natural/Non-natural meanings

<table>
<thead>
<tr>
<th></th>
<th>Natural meanings are factive</th>
<th>Natural</th>
<th>Non-natural</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>attributions of meaning are factive</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>ii</td>
<td>(\alpha) means (\beta) (\rightarrow) what is meant by (\alpha) is (\beta)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>iii</td>
<td>(\alpha) means (\beta) (\rightarrow) somebody meant (\beta) by (\alpha)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>iv</td>
<td>(\alpha) means (\beta) (\rightarrow) (\alpha) means ‘(\beta)’</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>v</td>
<td>(\alpha) means (\beta) (\rightarrow) The fact that ([\alpha]) means that ([\beta])</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

The ‘\(\rightarrow\)’ marks a transformation or paraphrase of the left type expression into the type of expression on the right. The columns on the right indicate whether the transformation is permissible. For example, with (2) and (4) as inputs we get the following outputs, with ‘A’ for acceptable, ‘U’ for unacceptable, and subscripts used in an obvious way:

A-ii) What is meant\textsubscript{\text{NN}} by the rings on the bell is that the bus is full.

A-iii) What somebody meant\textsubscript{\text{NN}} by the rings on the bell is that the bus is full.

A-iv) Those three rings on the bell mean\textsubscript{\text{NN}} ‘the bus is full’.

A-v) The fact that he had those spots meant\textsubscript{\text{N}} that he had measles.

and,

U-ii) What is meant\textsubscript{\text{N}} by those spots is that the boy has measles.

U-iii) What somebody meant\textsubscript{\text{N}} by those spots is that the boy has measles.

U-iv) Those spots mean\textsubscript{\text{N}} ‘the boy has measles’.

U-v) The fact that the bell has been rung three times means\textsubscript{\text{NN}} that the bus is full.

\textsuperscript{104} In each of these five cases some leniency must be allowed with respect to tense and number. Square brackets are used in (v) to show that even more freedom in paraphrasing is required.
Grice neither justifies his classifications nor explains the respects in which the expressions are acceptable or unacceptable. However, he describes the unacceptable examples using words such as, "I cannot say ..." or "I cannot argue from ... to ...", and since he is obviously physically capable of producing the unacceptable sentences he writes and of giving arguments he would not himself endorse, we should assume the force of his 'can's and 'cannot's is something like 'can (cannot) without social impropriety'.

Although intentions do not figure explicitly in either of the recognition tests Grice suggests, tests to which we shall turn momentarily, they might nevertheless be assumed to have a determining role in the proposed classifications. For instance, given the rule that non-natural meaning can result only from intentional action we can generate the above results. In fact, this would clarify matters somewhat, for it would exclude from the set of acceptable non-natural meanings a case such as A-ii where three inadvertent rings of a bell are produced by three quick stomps on a brake pedal made only to avoid an accident. It would similarly include in that set a case such as U-ii where a boy draws spots on himself to avoid school through misdiagnosis. Indeed such a rule would also explain why facts cannot non-naturally mean anything. This intention based criterion is essentially that explicitly proposed by Augustine, and whether it was tacitly assumed by Grice is uncertain but presumable.

4.3.2 Recognition tests

The explicitly endorsed Gricean criteria remain somewhat hidden in the intricate interrelations of acceptable and unacceptable uses highlighted in "Meaning", but they come to the fore in "Meaning Revisited". There Grice writes

I have offered one or two recognition tests which might enable one to tell which of these, natural or non-natural meaning, one was actually dealing with in a given case. The tests were, roughly speaking, that the non-natural cases of meaning, cases which are related to communication, are what we might call non-factive, whereas the natural cases are factive .... I also noted that the specification of the non-natural meaning of items can be comfortably done via the use of phrases in quotation marks, whereas [for
cases of natural meaning] it does not look as if one can replace the that clause ... by a sentence in quotation marks.\textsuperscript{105}

The word ‘factivity’ is chosen for its association with predicates such as ‘knows that \( \varphi \)’ (as opposed to ‘believes that \( \varphi \)’) - i.e. those which entail or presuppose the truth of one of their arguments. Grice writes,

\begin{quote}
anyone who says “Those black clouds mean rain,” or “Those black clouds meant that it would rain,” would presumably be committing himself to its being the case that it will rain, or that it did rain. However, if I say “His gesture meant that he was fed up,” under an interpretation of a non-natural kind, one specially connected with what we think of as communication, then to say that does not commit you to his actually being fed up.\textsuperscript{106}
\end{quote}

As above we should assume that the commitment Grice mentions is a social requirement to retract statements such as “those black clouds mean rain” if no rain comes. The difference between attributions of non-natural and natural meaning depends on the fact that people may deliberately deceive each other, whereas clouds, measles, and other related phenomena cannot deliberately do anything. Thus, claiming these are factive is like saying they are necessarily honest, and from this comes a sort of detachability. Given the truth of “those black clouds mean rain” and the presence of those black clouds, we can validly infer rain. Not getting rain would be like validly arriving at an obviously false conclusion; it should force us to abandon a premise, and since we do not want to abandon what was given by our seeing clouds we abandon the attribution of meaning. No similar inference is available for attributions of non-natural meaning.

But are clouds necessarily honest? Certainly they cannot deliberately deceive anyone, but they often do deceive us, a fact clear to anyone who has packed an unneeded umbrella. In §1.3 we suggested that Grice might have done well to emphasize, as Augustine did, that “[A] sign is a thing which, over and above the impression it makes on the senses, causes something else to come into the mind as a consequence of itself.” This is because when Grice discusses the factivity in virtue of which rain can be detached

\textsuperscript{105} Grice 1989, 291.

\textsuperscript{106} Grice 1989, 291. The ‘you’ should presumably be replaced with ‘me’ since Grice is saying something potentially commits him to its content, not his hearers or readers. Also, strictly speaking, it is not the interpretations which are done either naturally or non-naturally. It is instead the statements that are interpreted as belonging to classes of natural or non-natural meaning.
from black clouds, it is unclear how this relates to observers. For Augustine there are no signs without minds. Conversely, in giving factivity as a criterion of natural meaning, Grice entirely divorces some meanings from their interpreters. That this is likely to be a point on which intuitions divide does not of itself count strongly against his proposal. However, as we might infer from their divorce, relations between observers and natural meanings become strained on Grice’s account.

Consider again the second of Grice’s illustrative examples given at the beginning of “Meaning”:

(2) Those spots didn’t mean anything to me, but to the doctor they meant measles.

If both instances of ‘mean’ are assumed to indicate natural meanings, this sentence should be contradictory. The contradiction can be avoided by claiming that the expression “didn’t mean anything to me” is just another way of saying “I was unable to interpret their meaning”. However, no such move is available for

(2’) Those spots meant chicken pocks to me, but to Fred they meant measles.

If the word ‘meant’ indicates a natural meaning, and if natural meanings are factive (and exclusive), then there is a clear contradiction. But we do not interpret such sentences as contradictory. Since humans are fallible we are faced with a choice, we must either abandon the requirement that natural meanings are factive or abandon the supposition that they are relativized to observers. To us the former seems preferable, and even if the choice were not forced upon us we might want to abandon factivity as a criterion.

Factivity is not an easy feature to determine: it requires that the sides of the meaning-attribution be necessarily connected. Particularly problematic in this regard is the fact that each of Grice’s examples involves either a plural demonstrative pronoun or a definite article. Factivity presumably occurs at the level of at least nomological laws, and “those clouds”, “those spots” and “the budget” are all on a different level. For example, how are those clouds to be necessarily connected to rain? Typing clouds with the precision required to establish laws is not an easy (perhaps even a worthwhile) thing to attempt, and showing that a particular cluster of clouds is necessarily connected to rain is
possible only if it can be shown to belong to a type that is so connected. Laws that explain the gross phenomena on which Grice’s examples depend do not themselves involve types of the sort Grice seems to envisage. This is as true of spots and budgets as of cloud clusters.

Abandoning the first of Grice’s criteria leaves his distinction in shambles since the other criterion cannot stand alone. This is partly because the other, which involves comfort of quotation, is not itself very clear. One thing that is clear is that the type of quoting on which it depends is not the usual sort that separates use from mention. As Cole points out, “If it were so, if meanings could be sentences, then it would seem it should make sense to say that the three rings of the bell mean something with four words, or mean something with no x’s, or in this example mean something that is English only.” Cob suggests interpreting A-iv as elliptical for “those three rings on the bell mean the same as saying ‘the bus is full’.” This would indeed separate the use of ‘means’ involved in A-iv from that in U-iv since no similarly plausible elliptical interpretation is available for the latter. We should not say “Those spots mean the same thing as saying ‘the boy has measles’” since in some sense the spots indicate more strongly than the sentence. However, if this is the case then it is not the comfort of quotation that is doing the work but our intuitions about the strength or reliability of indication, which Grice confusingly suggests is absolute in the one case and rightly claims is fickle in the other.

Why we perceive a difference in the relative strengths of indicators is something we shall attempt to explain in the final chapter. As might be expected we claim it depends more on differences between the causal histories of human interactions with the types of phenomena involved than on any fundamental difference between those phenomena themselves. We assume such causal histories are more effectively able to explain and separate the distinction that concerns Grice than are his own criteria. Factivity, which while it may be ontologically sound, is epistemically out of place; comfort of quoting depends upon intuitions Grice leaves unexplained. So while we agree that there are differences between cases involving what Grice calls natural and non-natural meaning, we do not feel these cases are well divided or explained by his recognition tests. Before

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we give a competing account, however, we should consider Grice’s reasons for preferring his formulation of the distinction to earlier ones and say something about the significance of his and of other influential versions.

4.4 Reasons for and against preferring Grice’s formulation

4.4.1 Those for
Grice offers three reasons for preferring his formulation of the distinction between natural and non-natural meaning to earlier similar distinctions. He writes,

I think my formulation is better. For some things which can mean, are not signs (e.g. words are not), and some are not conventional in any ordinary sense (e.g. certain gestures); while some things which mean naturally are not signs of what they mean (cf. the recent budget example).

4.4.2 Those against
No arguments are given for any of the three points, and each of them is contestable. First, Grice’s claim that words are not signs merely expresses a personal idiolectical preference. Before Grice wrote “Meaning”, Saussure had popularized ‘semiology’ (from Greek sēmeion ‘sign’) as a word for “a science that studies the life of signs within society,” of which he claimed linguistics is part. Peirce too had adopted the related word ‘semiosis’ for a general theory of signs, including linguistic ones. It is not an understatement to say that nearly all philosophers of language working or studying in 1957 would have had at least a passing familiarity with these influential works. Thus, talk of “linguistic signs” would not have confused Grice’s readers then; nor should it do so today. Indeed his insistence that words are not signs obscures some of the similarities between linguistic and non-linguistic signs which prompted the introduction of the word ‘sign’ into language studies. So far from being an advantage for his formulation, exchanging the word ‘sign’ for ‘meaning’ causes more problems than it solves; as does exchanging ‘conventional’ for ‘non-natural’.

109 Saussure 1966, 16.
Taking the latter first, substituting ‘non-natural’ for ‘conventional’ can cause confusion on two fronts. First, ‘non-natural’ suggests non-human, and since it is humans, themselves natural, creating most of the non-natural meaning, this is apt confuse readers. Indeed human languages are commonly referred to as natural languages, so to say that the meanings they convey are largely non-natural also cuts against the grain of common usage. Whereas the first sort of confusion stems from unwanted associations, the second stems from a lack of wanted ones. The word ‘conventional’ is likely to prompt more of the right sort of questions than is ‘non-natural’. For instance, contrast the following pairs. “How do conventions arise?” vs. “How do non-natural things arise?”; “What does following a convention involve?” vs. “How do we partake in something non-natural?”; and, “Are conventions natural?” vs. “Can non-natural things be natural?” In each case the former question is better suited to offering insight into language than is the latter. Talk of conventions invites historically minded reflection and, we may hope, also causal explanations. Talk of non-naturalness invites only confusion.

Replacing ‘sign’ with ‘meaning’ is also problematic. ‘Sign’, though not favored by Grice, is at least taken by others as a word for physical objects. We can draw signs, erase signs, and if we allow that words are signs of a special sort we can speak and write signs too. Meanings are trickier. On most accounts they are abstract entities which we “grasp” and “express”. Neither meanings nor the relations by which we interact with them have been adequately explained. Therefore, both proposed substitutions – ‘non-natural’ for ‘conventional’ and ‘meaning’ for ‘sign’ – raise more problems than they solve. Indeed, whether the substitutions solve any problems has not been established.

Grice’s reason for the first substitution is that words are not signs. We dismissed this as an idiolectical preference not generally shared. His reason for the second substitution is that some gestures which can mean non-naturally are not conventional. This claim is debatable. Condillac, for instance, observes that perfectly arbitrary gestures will fail to be understood. In fact it is hard to think of a type of gesture that could mean something non-naturally and yet not do so by virtue of its observer having previously seen that type of gesture connected to an effect similar to that which its use is meant to occasion. For instance, a faked sneeze might non-naturally mean that pepper is going into some dish, and although this is perhaps not a conventional sign for cooking with pepper,
it nevertheless gets its desired effect by exploiting incidental effects of previous interactions with pepper. We argue that this exploiting of incidental effects is part of the process for which the language of 'convention' is introduced to explain, and in this regard 'convention' is preferable to Grice's more absolute sounding alternative since conventionality more readily admits of degrees.

The third and final reason motivating the change of terms is that some things which mean naturally are not signs of what they mean. The recent budget example is suggested as a counterexample. Although the assumption that for something to mean naturally it must be a sign of what it means is not obviously part of pre-Gricean formulations, we may accept the assumption for argument's sake. Thus the budget can present a challenge in two ways. Either it is not a sign, and hence not a sign of anything, or it is a sign but not a sign of what it means. Grice probably does not consider it a counterexample for the first reason. If he did, why include the extra qualification? Also, if something as vague as "the spirit of the age" can be considered a sign of things to come, why should a budget not also count as a sign?

Considering it as a counterexample for the second reason is problematic in that Grice does not explicate a notion of "being a sign of x" that would allow us to see whether in fact the budget is not a sign of hard times. Without criteria for deciding whether something is a sign of something else we might just as well say that the budget is a sign of hard times as say that it is not.

So none of the three reasons Grice gives for favoring his formulation to earlier ones is convincing. Words may be plausibly be considered signs; gestures that mean something non-naturally do so in virtue of exploiting previously observed incidental effects and so have features in common with the conventional; and it is unclear both that previous versions of the distinction would require considering the budget as a sign of hard times, and that it is not such a sign. The problems he attributes to earlier words are either insufficiently defined or not problems at all, and since his proposed substitutes in fact invite more confusion, they should not be adopted. In the next section we turn a critical eye toward the significance of the traditional terms and ask how well they fit the phenomena they are introduced to explain.
4.5 Connotations of some traditional terms

4.5.1 ‘Convention’

We have argued that ‘convention’ is in some ways more suited to describing language than is ‘non-natural’. For instance, unlike ‘non-natural’ it prompts thoughts of human interactions, of possible historical explanations, and of connections that are not necessarily established. But in some ways it is worse, especially insofar as it connotes a meeting or assembly. No one of course assumes that it is the job of some subset of delegates from a linguistic community to convene and determine which sounds ought to occasion which effects. Nevertheless, despite the absurdity of this suggestion something very close to it has been influential in discussions of language origins.

The standard picture is one of two or more people sitting around, all of whom would like to talk about something that each already “has in mind”. This mutually felt need prompts one of them to create a word for “the object of their thoughts”. They then “mutually agree” to use that word and henceforth the thing is so named. Though roughly expressed this is perhaps not an implausible story for describing some situations that occur once a language system is in place. But as a picture of language origins it is unacceptable. In §2.3.1 we argued against the view that thoughts exist fully formed in mind prior to receiving linguistic expression. Also, it should be noted that sounds we would today consider words were a late arrival (and sentences much later still) in the evolutionary development of language. The bumbling first efforts toward linguistic expression cannot be thought of in any useful way as being like the agreements reached at conventions.

4.5.2 ‘Agreement’

It is strange to describe the process whereby sounds and objects are associated as one involving agreement. In the weakest sense, agreeing to use a sound for an object might only involve behaving appropriately when that sound is made or making that sound oneself in appropriate contexts. On this reading birds and beasts can be said to agree on the choice of their noises, which is something many would want to deny. It is however hard to imagine our early ancestors agreeing on the proper use of sounds in any stronger
sense. Even in later stages, where a language system is in place, the type of thing involved in learning a language should not be described as agreement.

While we may agree to switch from one language to another in a given discussion, or to move away from our native land and thereby dissociate ourselves from our original linguistic community, the type of agreement involved in the use of our first language is importantly different than this. A child does not agree to call a ball “a ball,” she just learns that those sounds are associated with those spherical items. That is, our mother-tongue compels us to make the associations we do. Indeed it is very difficult to hear one’s first language as mere sequences of noises or to see well-formed strings as mere marks, as foreign languages can initially present themselves. In foreign countries we cannot help but notice, nor easily block from attention, others speaking our language, nor fail to see English signs in the way we do. Agreement sounds especially odd when attributed to a monolingual environment. Talk of agreement among members of a speech community is very different from other events described by the same word.

Of course novel linguistic items may be given stipulated meanings, and the meanings of given linguistic items may be changed by stipulation, but these actions inevitably begin within relatively local limits and rarely reach beyond those limits. Those types of agreements are exceptions, not norms.

4.5.3 ‘Arbitrary’

Many who claim that language is conventional explain their claim by saying that linguistic items are “arbitrarily” associated with their referents. Like ‘convention’, ‘arbitrariness’ nicely evokes the idea that there is no necessary connection between, say, the English word ‘tree’ and the objects it denotes. Similarly there is no necessary connection between the Old Saxon ‘trio’, or the Gothic ‘triu’, and their referents. However, ‘arbitrary’ also suggests that no laws are at work in establishing the connection between signs and their objects. It suggests that any sign or sound could signify any object, and while this might be true over very large-scale timeframes, it certainly obscures understanding of more short term relations.
We might think of degrees of arbitrariness in terms of probabilities. The probability that the English word ‘tree’ should pick out the items it does, considered on a timescale stretching from the age of primordial soup to that of today, if not zero is extremely close to zero. Indeed the probability that humans should have evolved as they did, or even that they should have evolved at all is itself near zero. So in this instance we might say that the level of arbitrariness is at its highest. When we shorten the timeframe so that it stretches back only about one hundred thousand years, then the probability of ‘tree’ naming trees increases, albeit ever so slightly. This is because many of the physiological features required for the production of speech were already presumably partly established in our early ancestors. A lion’s roar was no longer an “option” as a human sound for picking out trees. Nevertheless, the human phonemic resources remained virtually inexhaustible, and any combination of sounds could have served as well as any other. Or could it?

It is in fact false that any sound could serve as well as any other. Long or overly noisy lingual productions are obviously selectively disadvantageous given the need for speed and stealth. Also, speech that is very “breathy” or “garbled” might fail to occasion appropriate actions. The range of expressions available for naming trees is again constrained, though at this stage the probability of the sound or marks of ‘tree’ winning out is still near zero.

Probabilities only begin dramatically to increase as timeframes become much shorter (also provided that their histories are held constant). For instance, if we shorten the timeframe so that it includes only the last one thousand five hundred years then the probability of ‘tree’ naming trees jumps considerably, for at that time ‘trio’ and ‘triu’ were most likely already in use, and their users began a slow process leading toward us “tree-sayers.” The probability that a speaker born today in an English speaking country will grow up to call trees “trees” is very high indeed. Thus, claiming that sounds and objects are arbitrarily associated, since generally assumed to be two-valued, is liable to miss the subtleties that the language of probability or of degrees of arbitrariness can capture.
4.5.4 ‘Artifice’

The last of the traditional terms to consider is ‘artifice’. Insofar as it connotes language was brought about by constructive skill rather than by spontaneous accident it is a poor choice. There is more reason to suppose that early changes made while moving toward language resemble recent or current ones (e.g. schematization, logicalization), which are largely products of unnoticed development, than to suppose that language was the product of conscious influence.

Of course, when a language system is firmly in place meanings may be stipulated and words defined so that they serve in any number of ways. Technical pursuits require technical language and often there is no familiar word able to satisfactorily fill a required role. So-called “terms of art” are often invented or appropriated from other disciplines and put to new use. The class of stipulated meanings is, however, a small one compared to that of ordinary discourse. Also, the influence of technical terms rarely spreads beyond local areas. Therefore, although the word ‘artifice’ may appropriately be applied in cases such as these, it does not convey as clearly as its competitors that there is no necessary connection between a sound or inscription and its referent(s), nor that the associations made are constrained by temporally antecedent states.

4.5.5 More recent alternatives

As should already be clear, we view language as an evolved species on the understanding of those terms defined in the previous chapter. Earlier and later stages can be linked via an engendering relation, and given previous states the probability of later ones can be at least roughly quantified. The engendering relation is already fairly well understood in the case of functional vocabulary, and there is no reason to suppose that it applies universally in human language.

In the next section we show how higher order causal explanations are required to explain the phenomena which led to the introduction of the traditional terms examined here. Those considerations also shows that the difference between so-called natural and non-natural meanings, or between natural and conventional signs is not the result of fundamental differences between the phenomena involved.
5 NEW STANDARDS OF DETAIL

5.1 A biological trinity

The distinction between natural and non-natural meanings does not cut along some fundamental non-arbitrary division of things. To see this we examine the relevant phenomena in a little more detail than has been usual in philosophical discussions. We consider two paradigmatic examples of natural meaning. The first, smoke and fire, is due to Augustine; the second, spots and measles, Grice. We consider these examples under three section headings: ontology, ontogeny, and phylogeny. Here a word or two to clarify the aims of the respective discussions.

The distinguishing feature of the first category is its relatively high level of observer independence. In this section we show that the stuff involved in the natural-meaning pairs is not fundamentally different from that of language. The discussion follows two main lines. Along the first we examine causal interactions; along the second, the causal histories of causal interactions. We call these first-order, and second-order investigations respectively. Although there are certainly differences between the explanatory demands of the natural-meaning pairs and of language, we argue that in each case explanations should be of the same order, thus that the division is specific rather than general.

Under the heading, ontogeny, we look at the developmental histories of individual organisms. Specifically, we compare the acquisition of diagnostic skill with the acquisition of language. There are obvious and dramatic differences between learning to associate smoke with fire or spots with measles on the one hand, and learning to make the subtle discriminations required for partaking in a conversation on the other, but again we argue that these differences are specific. One important similarity is also noted, namely that temporal or geographic differences affect the type-diagnostic skill or language acquired. We suggest this feature is partly to be explained under the third heading, phylogeny.
Under the heading, phylogeny, we examine evolutionary histories of the diagnostic skills involved in associating natural meaning pairs. These are compared with an evolutionary history of language. One major difference is that in the case of natural meanings, changes occur at pronounced and recognizable moments, whereas in language the changes are subtler and harder to locate temporally. Nevertheless, the transmission practices are similar in both cases as are many features of the engendering relation linking earlier and later states. We give examples to illustrate how both earlier diagnostic interventions and linguistic interventions constrain and license future ones. Similarities here strengthen the claim that second-order explanations are required by both the natural and allegedly non-natural phenomena of interest; thus also that the natural/non-natural divide is less fundamental than philosophers have supposed.

5.2 Ontology

5.2.1 Smoke and Fire (I)

Augustine gives two reasons for his claim that smoke is a natural sign of fire. First, smoke “leads to the knowledge of something else” and so qualifies as a sign; and second, it “does so apart from any intention or desire of using [it] as [a] sign” and so qualifies as a natural one. For now we set aside the requirement that there be an agent for whom seeing smoke might lead to knowledge of fire. We are concerned only with the ontology of combustion; first with the causal reactions it involves, and second with the causal history of these causal reactions. We also explain why, as cases of spots and measles or linguistic productions and their effects do not, smoke and fire seem to resist second-order physical explanations.

Consider class-A fires. These involve unaltered natural fuels such as wood, grass, etc. Fire, which is an exothermic oxidation reaction, erupts when the fuel source is sufficiently heated, at which point the heat decomposes the fuel’s hydrocarbons into gases. These gases contain compounds of carbon, oxygen, and hydrogen. Smoke is composed of these gases combined with ash (i.e. non-flammable elements such as calcium, potassium, magnesium, etc) and with burning fuel particles. The flame in a class-A fire results because carbon atoms are incandescent at high temperatures, and
since smoke and fire are subject to gravity, and are hotter and less dense than the surrounding air, they rise. This explains the upward "licking" appearance of the flame, which is absent from photos taken of flames in micro-gravitational environments, where flames are seen to form spheres.

Fires belonging to the other three standard classes are essentially similar to those of class-A. They differ only in the type of fuel which sustains them, which may be a flammable liquid or gas (class B), an energized electrical wire or piece of equipment (class C), or an "exotic" metal (class D). Of course different fuels require different methods of extinguishment, but generally speaking all fires are the same. They require oxygen, fuel and heat in order to continue the process of breaking and forming of chemical bonds. They are subject to gravity. The reactions are well understood: their activation energies and component parts can be accurately quantitatively represented, and as firework shows and motor cars attest we have gained considerable control over the processes involved. In this regard combustion differs from the processes relating spots and measles and those relating language and neural effects.

Another difference is that, unlike the other two examples, providing even the roughest sketch of the causal history through which the causal processes involved in combustion came to be as they are is exceedingly difficult. If it were true that smoke and fire have always behaved as they do at present, then their causal history would surely be a short and boring one and no one would feel any the worse for not being able to expand upon it. But in fact the history of smoke and fire is far from static. As professor Hawking informs us,

All the evidence seems to indicate, that the universe has not existed forever, but that it had a beginning, about 15 billion years ago. This is probably the most remarkable discovery of modern cosmology .... At this time, the Big Bang, all the matter in the universe, would have been on top of itself. The density would have been infinite. It would have been what is called, a singularity. At a singularity, all the laws of physics would have broken down.\textsuperscript{110}

The problem, then, is not that the breaking and forming of chemical bonds or the influences of gravity have always been as they are, but rather that little is known of the

\textsuperscript{110} Hawking 2006.
earliest states of the universe, of the “time” when the laws of physics are supposed not to have held. Therefore anyone hoping to give a physical history of the smoke-fire relationship faces the problem that such a history must at once encompass both cosmological and instantaneous timeframes. A cosmologically adequate grasp of physics would be a second-order understanding.

That combustion has such a history, one which involves change is universally accepted among those in the know, for these people believe there was a time when neither smoke nor fire existed. Thus there is a story to tell about how the one state arose from the other, and that story, though currently elusive, is one that we believe must resemble any other second-order physical theory. It must explain how the causal effects of an earlier time engendered those of a later one.

5.2.2 Spots and Measles (I) \textsuperscript{111}

Two of Grice’s three sentences illustrating cases of natural meanings involve spots and measles. Unlike smoke and fire, this example is clearly of a biological nature and so admits of a more direct comparison with language. We begin with a review of measles symptoms. This shows both that Grice was less careful than he might have been in presenting his example and that diagnosing measles is more complicated than his example reveals. Next we examine the possibility of giving a second-order account of how earlier measles strains engendered later ones. As with smoke and fire we again find ourselves in a tough spot. Here the problem is not that the measles virus has existed in its current form since the beginning of known time; its very nature precludes that. Instead we face the problem that because so few details about the measles virus were known until very recently, much earlier strains cannot be compared with current ones. Thus hypotheses about changes undergone must inevitably find in unknowns, the sources of knowns. Of course our interests are not specifically with viral mutations and so the lack of detail available for sketching a second-order explanation of the virus is not particularly troubling for us. What emerges from even a superficial consideration is that like language

\textsuperscript{111} Technical information in this section is largely taken from two sources: (Beers, Berkow, and Merck Research Laboratories 1999, §19, ch. 235), and (Centers For Disease Control and Prevention 2005).
measles is a biological phenomenon. Like language its causal history is one of change rather than constancy.

Anyone with more than a feigned interest in Grice's examples of natural meaning (or with a genuine interest in measles) is sure to notice that the sentence "Those spots mean measles" is far from clear. Apart from any issues involving meaning the demonstrative pronoun simply insists on interpretation. It forces us to ask: "Which spots (naturally) mean measles?" The researched answer should be Koplik's spots, for these are generally considered pathognomonic for measles. Koplik's spots, sometimes also called Flint's spots or Filatov's spots, are those resembling grains of white sands surrounded by inflammatory areola. They appear on the buccal mucosa opposite the first and second upper molars of infected persons 1-2 days prior to the onset of the measles rash and remain 1-2 days after the rash. However, we cannot be sure these are the spots to which Grice alludes since the measles rash is itself a spotty event, and its spots are more readily visible than those inside the mouth. Indeed, in "Meaning Revisited" Grice explicitly mentions "spots on the face" in connection with natural meaning, though to be sure he does not specify the outside of the face.112

The measles rash is a maculopapular eruption that usually lasts 5-6 days. It begins at the hairline and over the next three days spreads downward and outward to the hands and feet. Generally the spots remain discrete, but they may become confluent, particularly on the upper body. In early stages these spots blanch under pressure, but cease to do so after 3-4 days. In its final stages the rash recedes in the same order that it appears, from head to extremities, sometimes with desquamation in severely affected areas. These spots it seems were those that caught Grice's attention.

The problem with supposing these spots naturally mean measles is that drugs such as phenobarbital or sulfonamides, and diseases such as Roseola infantum, produce rashes similar to that of measles. Thus if the rash's spots do in fact mean measles they do not do so univocally; considered alone they equally well signal the onset of other afflictions. The apparent conflict of this fact, coupled with the alleged factivity of natural meanings and with Grice's renowned conviction that senses should not be multiplied beyond necessity,

causes us to wonder at his choice of example. However, even if we assume Grice intended his audience to think of Koplik’s spots, and that he was simply mistaken in assuming the pathognomic spots appear on the face, we are still left with a problem.

In most cases measles is not diagnosed by the presence of Koplik’s spots alone. Without an ensuing high fever and occurrence of the measles rash with its characteristic cephalocaudal progression, even a well-trained diagnostician might take Koplik’s spots as a sign of something else. Also, in severe cases Koplik’s spots can combine to form a mottled erythema which might easily be considered a sign of something else by someone familiar only with the spottier looking, less afflicting cases. As a glance at the Merck Manual of Diagnosis and Therapy proves, fever and rash are not the only further symptoms to look for. Others include: development of pharyngitis; inflammation of the laryngeal and tracheobronchial mucosa; appearance of characteristic multinucleated giant cells in nasal secretions, pharyngeal and buccal mucosa; periorbital edema; conjunctivitis; photophobia; a hacking cough; mild itching; leukopenia with a relative lymphocytosis.

Further complicating matters is the fact that these symptoms are characteristic only of typical measles. Atypical measles exhibits differing symptoms. In particular its rash, which often begins 1-2 later than that of typical measles and in reverse fashion (extremities first), is pleomorphic and sometimes accompanied by severe constitutional signs...[which] may suggest Rocky Mountain spotted fever, leptospirosis, hemorrhagic varicella, or meningococcal infection; other differential diagnoses include certain bacterial or viral pneumonias, collagen vascular diseases such as juvenile RA, and Kawasaki syndrome. A history of measles exposure and prior administration of killed virus vaccine suggest the diagnosis, but virus isolation, serologic studies, or both may be necessary to confirm it.113

And in addition to atypical measles there is modified measles, which “occurs primarily in patients who received immune globulin (IG) as postexposure prophylaxis and in young infants who have some residual maternal antibody”; also, hemorrhagic measles, which “is characterized by high fever (105°–106°F), seizures, delirium, respiratory distress, and

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hemorrhage into the skin and mucous membranes." Furthermore, even among typical wild-type measles there is known to be various strains.

This brief review shows that the physical connection between spots and measles is more complicated than Grice's example reveals. We have seen that there are more than one type of measles and more than one type of measles spots. In some cases, such as in patients suffering from HIV infection, measles may occur without spots and spots without measles. As is to be expected in cases of this level of complexity—and we have broached only the clinical side of measles diagnosis without mention of the greater complexities involved in the laboratory work of molecular epidemiologists—we should expect there to be an accompanying story of how diagnostic skills have evolved alongside the disease's developments. While the topic of diagnostic advances properly belongs to the section on phylogeny it cannot be fully separated from another topic: the causal history of the causal reactions that measles comprises.

Giving a second-order explanation of measles is difficult and can hardly be discussed independently of advancements of diagnostic techniques because until fairly recently few details about the virus were known. We know that measles has an evolutionary history, if only because there was a time before the virus's arrival (and we may hope there will be a time of its eradication). Imagining such an antecedent measlesless state does not require the cosmological timeframes of smoke and fire, nor even biological timeframes that take us back to the beginnings of earthly life. "Francis Black notes that populations of sufficient size to sustain measles transmission would not have developed until sometime after 2500 B.C." This is because in at least its current form measles has "no reservoir other than humans, meaning that a continuous chain of susceptible contacts is necessary to sustain transmission." Black further "suggests that measles may be an adaptation of another virus of the same genus (which includes rinderpest and canine distemper)."

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114 Centers For Disease Control and Prevention 2005.
115 Kiple 2003, 212.
116 Kiple 2003, 212.
117 Kiple 2003, 212.
Although nothing can be said with certainty about the etiology of measles itself, some extrapolations can be based on the mutations undergone by other known viruses. As new strains of measles arise and are compared, further extrapolations can be made. Our point is simply that to understand the effects of the disease at a given time it would be necessary to situate that time in an evolutionary continuum whose processes are themselves understood. This is to say that having a second-order physical explanation of the measles virus would be required to explain why the disease currently behaves as it does and why it behaved differently at different times in the past; perhaps with such an explanation in hand we could also make reliable or helpful guesses about future developments. The early lack of specific and particularly laboratory knowledge of measles makes specifying the types of changes undergone forbidding. But this does not in any way count against the claim that a complete explanation has a higher-order component. The first-order component is ontogenic; the second-order component is phylogenetic. As with most biological phenomenon, (including language, we would maintain) this approach to explanation is among the best available.

5.2.3 Comparisons (I)

‘Ontology’ has been used here as a heading under which to discuss the relatively observer-independent aspects of natural meaning: what they are made of, how their causal processes work, and how those causal processes are the product of higher-order change. With language it is not as easy to take people out of the equation. For instance, those who agree with Saussure that language is physically situated in the brains of its speakers are committed to claiming that without speakers there is no language. This may sound initially like an odd position, for none should want to deny that today there is such a language as Ancient Greek or Old English even though there is no population, at least not one geographically specifiable, that speaks either language. That there are speakers however, at least within universities and other eclectic circles, and also that there is a possibility of inculcating future speakers is not a negligible factor when comparing intuitions on the ontological status of those languages. If in a thought experiment we extend the case so that no possible observers shall ever encounter the artifacts in question, be they books, tape recordings, or whatever, we might expect intuitions to be
divided. Some, such as Sartre, Rorty, later-Putnam, and the linguistic relativists considered in §2.1.3, argue that an observerless world – in Sartre's words, the nauseating in-itself – cannot intelligibly be discussed beyond claiming that it exists and contains stuff of some indeterminate sort. Others who describe themselves as more "realistically" minded insist that without observers trees would still be trees, dinosaurs dinosaurs, and language language. We cannot hope to resolve this conflict of opinion. And we need not try.

There is, however, a sense in which language can be divorced from its users. Viewed in this way it is comparable with other physical, biological processes. Everyone grants that having a brain is essential to understanding and producing language. The evidence accumulated through encounters with victims of trauma is indisputable. So too is it indisputable that the brain is an organ whose functions are largely electro-magnetic and chemical in nature, and one whose processes are increasingly physically describable. An average sized adult human brain weighs between 1300 and 1400 grams. In receiving and producing linguistic events its centers of increased activity, evidenced through electro-magnetic and chemical changes, are detectable and located at least in areas known to involve language long before the new clinical methods of testing were developed. In at least this manner language may be considered independently of its users. Although it is debatable whether the marks and sounds of language count as language without potential observers, none can contest that these are physical marks and sounds.

Physical descriptions of language are still in their infancy. This is not surprising, given the difficulty of similarly describing much simpler human actions such as locomotion. While none of us should hold his breath for the coming of descriptive advances, and indeed since we are members of a biological species with survival overrides, none of us could, we should expect advances to come. What should philosophers of language be doing before this time? We suggest a reasonable pursuit is to attempt to explain how it is that linguistic productions come to have the effects they do, and to do so without overstepping the boundaries of physical description. This requires at least two things. First, it requires a diachronic perspective sensitive to change. Because language is an evolved biological phenomenon we cannot hope to explain it fully without reference to earlier stages and the changes through which later ones developed.
Second, it requires reevaluating the traditional methods of description. No longer should the languages of folk-semantics and folk-psychology be automatically assumed sufficient. On the ontological level language is not fundamentally different from the phenomena of natural-meaning pairs, and just as these are typically explained without essential reference to recondite objects, so too should language be approached.

5.3 Aside: Describing change

This chapter is primarily concerned with change. Discussing the first-order changes of the last section was relatively unproblematic since there is a well established vocabulary for describing the causal processes at work. The chemical elements and reactions involved in combustion have been identified and named, and although descriptions are often given in non-technical terms these are generally understood to serve only as shorthand for the more basic equations. The situation is similar regarding the measles virus, its symptoms, and the medical and more homely diagnostic names used in their description.

The second-order changes were more difficult to describe. However this is only partly because of vocabular difficulties. The bigger problem is that we do not know what things were like before, nor do we know what type(s) of changes occurred to bring about our current states. It is as if we were asked to describe the contents of a box without a means of sensing them. If they were to become accessible in some way we might recognize that extant vocabularies are entirely adequate, but as is we can only extrapolate backward from known cases. For fire this is done in the language of mathematics, for measles a virological vocabulary is developing to replace recent crude alternatives.

When we move to describing language and the related processes in its users the situation is quickly complicated. Part of the problem arises from the fact that every linguistic intervention occurs within a spatio-temporal environment that is extremely rich in sensory resources. Determining which of these is salient and should therefore figure in descriptions of those events is not easy. Also, much that is salient is itself linguistic. In the language of discourse semantics, the "common ground" – i.e. the set of propositions which the participants in a conversation agree to be uncontroversial for the purposes of
that conversation – is in constant flux, for it “always includes the thoughts [that the participants] have stated to one another insofar as such thoughts have not been challenged or withdrawn.” Thus, ‘thoughts’, ‘propositions’ and ‘common grounds’ can serve as tools for discussing certain types of change. As should be clear these are not tools we would ourselves like to see shape discussion. Talk of short-term memory offers a slightly less recondite but still coarse grained way of accounting for why certain conversational continuances are felicitous but others not. At the coarsest level the processes of short-term memory are described only in the language of folk-psychology, and indeed much of that vocabulary transfers directly into psychology proper. At finer levels involving neurological descriptions we find that typing events is problematic. For instance, we cannot now neurologically distinguish various semantic interpretations of a single sentence nor distinguish any of these interpretations from those of other sentences.

Despite its current limitations the language of neuroscience seems better fit to describe language processing and production than are its more folkly alternatives. For one thing, it can accommodate change across timeframes spanning a lifetime. Discourse semantics deals in conversation-lengths and does so entirely without regard for physical detail; the psychologies, although they often consider timeframes of sufficient length when they do so it too is without regard for physical detail.

What we require is a notion that captures some of the features loosely referred to with words such as ‘inference’ and ‘association’. The notion must be broadened however before being refined, for it is not isolated events that interest us but the establishment of what have in the past been called “behavioral dispositions”. We want to show, for instance, that smoke’s ability to occasion fire-related effects is not fundamentally different from the ability of a linguistic production to occasion some set of associated effects, and showing this requires a notion that can span at least ontogenic timeframes. Insofar as inferences and associations are considered short range events they are unsuitable. We have every reason to believe that neural systems dynamically change throughout the ontogeny of an agent and that these changes affect the responses that agent produces to encountered stimuli. We can also plausibly assume that there is

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something like a law of diminishing returns at work, for as we grow older we seem to become “set in our ways”.

For lack of a better term we shall talk of a “neuronal excitation pattern” (NEP for short). This is not meant to be a particularly technical term, but is used as a sort of reminder that the types of phenomena discussed are physiologically situated in the head, and that any claims made at this level are ultimately subject to confirmation or refutation by scientific investigational advances. The time for a black-box approach to the mind has passed. Nevertheless such an outmoded approach is sustained by philosophical discussion of the brain and its involvement in language use (and in reasoning more generally) in terms that cannot themselves be compared with fine-grained scientific discoveries. If, as we do, one wants to merge with the flow of scientific traffic then one has to drive carefully in accordance with the rules of that region. Concretely this means phrasing one’s hypothesis in a language conducive to comparison with others from the sciences. If, however, one is content to remain on one’s own property, then any sort of vehicle and manner of controlling it suffices, indeed this style of play is likely to offer considerable enjoyment. We suspect its likelihood of offering insight to be considerably lower. We therefore abandon mentalistic language even if only in favor of an as yet unclear alternative. We shall continue to make conversational use of terms such as ‘associations’, ‘inferences’, and ‘connections’; we emphasize however that these are merely stand-ins for more accurate physical descriptions.

Although many details must remain lacking some general comments can confidently be made. First, there is no reason to suppose that two observers are confronted by identical stimuli the NEPs occasioned in each will be alike either in their physical instantiation or in their typological description. If there were such precise matches what C. G. Jung introduced as “the association method” would be a boring and ineffectual technique; each of us would offer the same reaction to the same stimulus – e.g. upon hearing the word ‘head’ we might all react by producing the word ‘foot’. Nevertheless, there seems good reason to believe there are many similarities, both within an individual across her lifetime and between individuals even distantly separated by time.

119 Jung 1910, 219-269.
or space. We should assume NEPs will dynamically change throughout one’s lifetime, and change across broader phylogenetic timeframes as well, but some changes will be less drastic than others. In the case of the individual some synaptic pathways will likely become more well-worn than others and thereby permit easy travel along their routes. For example, a phone number often dialed is more easily recalled than one newly acquired. In some cases the neural connections made will be navigated so fast and automatic as to be considered “cortical reflexes” rather than “interpretive moments”. Across members of the same species we know that the centers in the brain that demonstrate elevated levels of activity in response to laboratory testing are at least roughly the same in all.

Second, the similarities and differences alluded to in the last paragraph are partly to be explained in terms of causal histories. If we want to know why a person’s NEPs are as they are we have to look at how he was raised, and on a larger scale we have to look at how his species developed the relevant capacities to have that type of physical arrangement. In short, second-order physical theories will be the relevant mode of explanation of the first-order causal reactions involved with NEPs. The task of the next two sections is to show that in many regards the situations that lead to the NEPs associated with natural meanings are not fundamentally different from those that lead to linguistic ones. The extent to which the NEPs involved in natural and non-natural meanings are physiologically similar is something to be empirically decided, but we can at least make a strong case showing that they are similarly established.

5.4 Ontogeny

5.4.1 Smoke and Fire (II)

When we consider smoke and fire in relation to human observers we free ourselves from the problems of cosmological timeframes which arise in connection with the second-order ontological account. Humans have been around for a relatively short time. Moreover, since in this section we are concerned only with the NEPs that develop within a single agent we can shorten the timeframes even further. Now, rather than cosmological time we are dealing with a lifetime.
No one is born knowing that fire usually produces smoke or that most types of smoke result from fire. The connection has to be established. Because fire is both dangerous and useful, instruction in its ways tends to begin early in life. Today encounters of a relevant type are less frequently encountered than in times past. The fireplace has become a luxury instead of a necessity; in kitchens electric power has replaced its smoky forbears; and candles have become a symbol of romance or relaxation rather than tools for reading or otherwise navigating the night. To be sure, even the flames encountered—such those from pocket lighters or gas ranges—are not smoke producing.

One way or another children learn to associate smoke and fire and also, generally in schools, they learn how best to behave around each. The association is a simple one, but nevertheless it sometimes yields surprises, as when one first contacts the cool sparks of sparkler or breaths the "smoke" of dry ice. The ease with which fire can be produced and controlled has stolen some of its magic. The ontogenetic development of NEPs that cause observances of the one to occasion effects related to the other is presumably quite different in a child of today than it would have been even a short time ago. In this regard the natural meaning connecting smoke and fire is not very different from other connections of linguistic sorts. The association needs to be learned and it is itself evolving.

Also, as is true of language, people can become more or less adept in their ability to deal with fire. For example, the associations a firefighter develops through the course of his life are sure to be quite different from those of a non-firefighter. Indeed, just as we develop early on an ability to converse in most of the basic situations we shall encounter, so too by late childhood we should have developed sufficient knowledge to live safely with fire. Developing more specialist abilities in both cases requires further training. How the connections are ontogenetically established thus appears similar for natural and non-natural meanings.
5.4.2 Spots and Measles (II)

More diagnostic skill is required to infer measles from spots than fire from smoke. We saw in §5.2.2 that there are many strains of measles, that the spots between cases exhibit considerable variation, and that measles can occur without spots and spots without measles. For the diagnostican to be effective requires knowledge not only of measles but of various other diseases. The point, in short, is that it takes a skilled person to diagnose measles successfully. Therefore if we choose to talk of spots as “meaning” something, we should remember they means something only to fluent individuals, those capable of making the required discriminations.

Grice observed that spots might mean something to one person and not to another (see his (1) and (2) above). However, he did not recognize that in this manner the “inferences” involved in natural meanings are strikingly similar to those in language. If the spots or symptoms of measles are likened to the words or to sentences of a language, then doctors might be compared with native speakers. Mothers of infected children would presumably be proficient, whereas the lucky few who completely avoid contact with the disease would be as foreigners.

The aptness of the comparison depends partly on our ability to show that the process of acquiring the discriminatory capabilities involved in diagnosing measles from complexes of symptoms is like that of language learning. The first thing to note is that acquiring medical diagnostic skills more closely resembles acquiring a second language than it does acquiring a first. This is because the task is approached with a wealth of relevant knowledge. Although both the visible features of diseases and the words used in their descriptions will be new to the tyro, these nevertheless admit of comparison with known facts. For instance, to all the spots of measles look different from bites, blisters, and bruises. As the number of examples studied increases so do the discriminatory capabilities of the student. She learns where and how to look for identifying features; she begins to see subtle similarities and differences where previously she saw none; measles comes to look different to her from scarlet fever and roseola infantum. Also, although the words that accompany these newly acquired discriminatory capacities are themselves new they admit of translation into a known language. For example, much as a
monolingual anglophile might learn that 'maison' is French for 'house', our novice diagnostician learns that 'telangiectasia' is used in place of what she might previously have referred to as 'dilated superficial blood vessels'.

The important similarity is not simply that becoming a doctor and becoming fluent in a second language both involve learning some new vocabulary, though of course they do. Vocabulary without grammar can at best be made inefficient use of, and the case is the same with diagnoses. The medical student's new words, though helpful, are secondary to the actual work of diagnosis: the essential feature lies with the discriminatory capacities involved. Knowing to look in a patient’s mouth for tiny punctate blue and white spots on inflamed buccal mucosa, and knowing if that these are absent diagnostic progress should follow pathways toward diseases other than measles is more important that knowing any number of technical terms.

Constructing a sentence is like conducting a diagnosis. In each early steps constrain the range of potential continuations. Hearing a plural anaphor used of a singular subject (though less offensive) is offsetting in the same way as having a thermometer inserted under one's tongue after complaining of a sprained ankle. I suppose one might argue that the difference lies in the amount of brain present in infancy for language and for diagnosis.

5.4.3 Comparisons (II)

We claim acquiring diagnostic skill resembles acquiring language. Like learning a second language, diagnostic ability is approached with a wealth of related knowledge. Recognizing or naming parts of one language helps in acquiring another as does a lifetime of differentiating bruises from scrapes, hives from pimples, odd spots from safe ones. Accurate descriptions of the phenomena come from training and practice. Acquiring a first language is also like learning to connect the sides of a natural meaning. For instance, both are largely done through a process of trial and error rather than on the basis of explicit instruction, and the best instruction in both is “hands on”. We cannot

learn to speak by watching TV,¹²¹ nor should we like to visit a doctor who had never seen patients except on TV.

Also, although conversational proficiency may be reached and simple instances of natural meaning items connected without formal instruction, becoming a firefighter or physician requires extensive training just as does becoming an adept language user such as a novelist, lawyer, or in the past a politician.

There are of course considerable differences between the two types of activity. Using language is by far more complex than any known medical diagnosis, and there does not seem to be any critical period after which diagnostic skill cannot be acquired. Though diagnoses can sometimes be require very subtle observations, they pale by comparison with the fine-grained discriminatory capacities required by language. Subtleties of tone, stress, and a myriad of other acoustic and visual cues must be recognized for the proper understanding of speech.

Importantly however, both language and diagnoses are physical events involving humans. Proficiency in each is ontogenically gained through a combination of experience and instruction, and ultimate performance depends on the quality and nature of preceding stages in the person’s history. To understand why people speak as they do, or connect the items they do involves examining their personal history. Also relevant are the histories preceding one’s personal development, those that follow longer evolutionary timeframes and that affect the species as a whole. Histories of this second sort are the topic of our next section.

5.5  Phylogeny

5.5.1  Smoke and Fire (III)

With phylogeny the importance shifts to the transmission of skills. At the earliest stages when smoke and fire came to be associated instruction would have been at least as

¹²¹ Scientific American reports of a case where “A boy with normal hearing but with deaf parents who communicated by the American Sign Language was exposed to television everyday so that he would learn English. Because the Child was asthmatic he was confined to his home, where his family and all their visitors communicated in sign language. By the age of three he was fluent in sign language but neither understood nor spoke English.” See (Wang 1991, 134-5).
shoddy as were the teacher's discriminatory capacities and skills of production. Certain mists and clouds might have erroneously signaled conspecifics and time would surely have been wasted with rocks that look like flints and tinders that look combustible. Food and warmth would presumably often have been missed.

Gradually, however, diagnostic and productive skills developed, as did the methods by which these were taught. Over time the original sides of the associative relation came to be at times divorced from one another; new methods of productions and new fuels required new methods of detection and prevention. Instructions had to be expanded. Dry ice and gas flames brought about a time when smoke could no longer be taken as a sure sign of fire, nor fire as a sure sign of smoke.

These new techniques and new fuels also made it so that special training was required for understanding fire and what to do should it unwantedly erupt nearby. Alternative energy sources made the physical presence of fire in the home unnecessary. Children of today neither learn the same things about fire nor learn what they do in the same ways as did even their grandparents.

The point is just that although relating smoke to fire is often considered simple and direct, it is actually a complex phenomenon with a history of change that, should we wish to explain the effects a child today has in encountering smoke, say that of a cigar, the causal history of smoke-fire-human interaction is relevant; all the more so if we are interested in saying why the effects occasioned today differ from those of even the past century.

5.5.2 Spots and Measles (III)

Someone wanting to emphasize the differences between natural and non-natural meanings might note that deciding whether the noises or marks of another should count as belonging to a language is a very different task from deciding whether the spots of another should count as ones produced by measles; but this comparison misses its mark. A more relevant one would instead compare the ability to recognize something as language with that of recognizing something as a spot. Both of these abilities we each possess. More relevant still is the ability to recognize some linguistic production as being
a member of a particular language, and that of recognizing some spot as a product of a particular disease. Once we reach this stage however the differences cease to appear major.

The precise etiology of measles is unknown. We mentioned that measles is unlikely to have existed prior to 2500 B.C. for until then there were not populations sufficiently large to sustain the chain of contacts required for the virus’ survival. The first written record in which measles is explicitly distinguished from smallpox, a disease with which it shares a history of diagnostic confusion, is generally attributed to the Persian physician Rhazes, though he quotes El Yahudi, a Hebrew physician living some 300 years previously. Coinage of the word ‘rubeola’ is due to translators of Avicenna, who wrote of measles around 1000 A.D. The word ‘measles’ may once have had a connection with leprosy through the Latin ‘miscellus’ or ‘misella’ (miserable), which are terms used to describe sufferers of the latter affliction; their sores were called “mesles,” and “John Gaddesden in the early fourteenth century unjustifiably coupled these mesles with the disease morbili.”

Through the seventeenth and eighteenth centuries numerous measles epidemics occurred, with their clinical features being discussed in 1670 and 1674 by Thomas Sydenham, and steps toward immunization were taken in 1758 by Francis Home. Prior to Henry Koplick’s 1896 publication in which the now eponymous spots were described and claimed to be pathognomonic for measles, the most famous study of the disease was that of Peter Panum published in 1846.

It was only in the last century that research into current vaccines began. “In 1911, investigators demonstrated that the illness was caused by a virus. By the 1940s, the virus had been cultured, and in 1954 it was isolated.” Subsequent research led to the attenuated (“live”) vaccine which was licensed for use in the United States in 1963.

So what has this history to do with language? The most important point of comparison is that the phylogenetic history of diagnostic skill and of language acquisition are both essentially stories of change. Each involves passing from a stage of absence to

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122 Kiple 2003, 212.
123 Kiple 2003, 212.
one of ability; and change is best described causally. That is, the most satisfying explanations of how one state gave rise to another, and also of how subsequent changes occur, are those that trace the causal steps involved. Thus, although the stories told to account for the abilities acquired will be different – indeed one took an evolutionary timescale to develop, the other a mere century – the method of approaching the phenomena to be explained in each case should be similar. It should trace the causal histories of the causal events that are its subject. Each stage in the development will crucially depend on those before it, and the problem is therefore to explain how early stages constrain and permit future ones.

5.5.3 Comparisons (III)

Like measles and fire, there was a time before language. The fact that humans evolved from non-linguistic ancestors implies that language itself underwent an initial period of development. As is evident to all who look, change remains a key fact about language. Many philosophers and linguists regrettably overlook this key element. They claim language can be explained as it is now without looking to the past, and they do not seem interested in predicting what language might look like in future.

We can of course say a lot at the first order. For combustion, viral infection, and language use we can fairly accurately describe the causal processes involved. We can, that is, reliably predict outputs from known inputs. Given sufficient activation energy, fuel, and oxygen we can predict combustion; given that someone is infected by a known virus we can predict certain symptoms; and given a linguistic interaction, for instance me saying “Please pass the salt” we can predict for well-mannered settings that I shall receive some salt.

The difficulties involved in giving fine-grained descriptions increase at each stage. Combustion is easily quantified, viral infections are becoming better understood, but with language processing and the effects occasion there is still much to be learned. Passing some salt is itself a complicated physiological event independently of linguistic priming; explaining how it is that my request prompts saying “No, I won’t pass you any salt because of your blood pressure” is currently beyond our descriptive abilities. A
physical description of the event could describe how hearing one linguistic construction leads to producing another. To explain why it does what it does we must go up to a second-order.

Saying that the one construction leads to the other because of its meaning or its ability to transfer a thought does not bring us to the second order. Indeed, it does not bring us anywhere except back to our starting point. Why, we ask, does hearing the one construction do any of the things for which these standard descriptions have been introduced? Answering this question requires looking at causal histories; and when we take this approach the first thing we notice about both natural and non-natural meanings is that, at least insofar as concerns their observation, they are evolved and evolving.

There is little to suggest the language children acquire is exactly that of their parents and much evidence to suggest that it is not. What children inherit from their parents is firstly a physical capacity for acquiring language, and secondly an ability to make phonemic discriminations and connect these with effects of appropriate types. Both sides of the inheritance are in flux, though the latter to a more noticeable extent. The changes involved are typically minute, but they are nevertheless noticeable to the philosopher who cultivates a tolerance for detail and a capacity to observe it. As timeframes increase in duration it is not noticing alterations that becomes the more difficult feat, one requiring an almost deliberate decision to see only constancy where change pervades.

The changes undergone are often of recognizably repeating types. In §3.4 we considered some characteristic types of change. All the evidence suggests that earlier states constrain and license other ones. This is equally true of the natural meanings considered. Diagnosing viruses is done on the basis of previous diagnoses and discoveries. It would be inappropriate to suggest that studies of the measles virus be conducted with leeches and sulphurs because the diagnoses successfully conducted in the past have been done in radically different ways. Entirely novel linguistic constructions will similarly fail to be understood, as Condillac was keen to observe. Future steps importantly depend on those that have come before, and it is only by understanding
earlier ones and the relations by which various stages are interrelated that we can hope to explain why current items have the physical significance they do.

Regarding language the questions we see in need of answer are

I) In what manner and to what extent are novel compositions constrained by compositions already made?

II) How do the effects of novel compositions exploit the effects of previous compositions?

Research into the processes involved is well underway. We have argued throughout this thesis that the research program is sound and superior to its alternatives for explaining the physical significance of linguistic constructions.
6 CONCLUSIONS

6.1 Final Remarks

This thesis has had three main goals which we hope have been met. The first involved tracing the distinction between nature and convention through the history leading up to and including Grice. This showed that the language of convention, and non-naturalness, has a long and generally one-sided history. Seldom was effort invested toward explaining the workings of convention. Instead it was almost invariably assumed that there was such a thing as convention and that it could account for how particular words come to be attached with particular things. To state the same point less troublesomely, conventions have been invoked to explain why language users utter the particular sounds they do, or write the letters they do, and thereby occasion predictable effects in other speakers of the same language.

Since these utterances, inscriptions, and their effects are all physical events, we argued that they should be physically accounted for. As we remarked at the outset, our aim was not to reduce anything to anything else. Specifically, we were not out to find some physical foundations on which the language of folk-psychology or folk-semantics could rest. Instead, we were (and are) interested in the phenomena that give rise to explanations of these folky sorts. The standard approach has been to assume mental states as basic and explain the phenomena in question in terms of them so far as is possible. Generally something with roughly the same features as conventions needs invoking, and either it too is taken as basic or explicated in mentalistic terms. Thus, mental states and convention have traditionally straddled the divide between that which explains and that which needs explaining. We showed how together they have been revolving in a circle: Thoughts are expressed by language, which has the meanings it does by convention, which are established by people having similar thoughts and desires.

We examined the Uniformity Assumption, which, if true, might permit escape from this circle. This is because if we had independent access to thought and its content,
at least enough so as to say that thoughts have always and in all places been the same, then we could go some way toward explaining linguistic behavior in terms of thoughts. But the evidence against that assumption outweighed that in its favor. Indeed, because the assumption has not been given specific formulation, it is impossible to evaluate. We concluded that the best way to get out of the circle is to abandon it, and to focus instead on the objects immediately available for observation. We traced some steps made in this direction, specifically those from ideas to words, to sentences, to languages and the physiological devices that make them possible.

Examining Grice’s distinction showed that the two criteria he deems most effective for separating the two types of meaning are factivity and quotability. Neither is particularly clear. If natural meanings are factive, they must be observer independent because it is false that for all observers they will occasion the same effects. We argued that meanings are interesting only in relation to humans, and thus that factivity is not a good criterion to distinguish one sort from another. The quoting device Grice mentions as a second criterion was unevaluable by us because of unclarity.

Our final chapter compared details of natural and non-natural meanings along three lines. We show that they are sufficiently similar to allow for a similar method of study. On the ontological level all is physical and changing. With smoke and fire the timescale required for describing observer-independent changes was seen to be cosmological, and so no story tracing its stages is available; nevertheless, given the general acceptance of a theory positing a singularity at which no laws like those currently effective were in place, we must presume a transition occurred even if the story is elusive. When observers are introduced we move into more manageable timeframes, specifically into evolutionary ones. For measles a story of development can be told in the language of etiologies, though due to lack of appropriate analytic laboratory techniques until the last century, the early stages of measles history must remain a mystery. Ontogenically and phylogenically we noticed that with natural and non-natural meanings alike, previous stages constrain and license future ones. While for each we could answer questions regarding its causal effects at a stage, for none can we explain why those effects are as they are without reference to earlier stages in the evolutionary histories, be these within an individual or within a species of individuals.
We ultimately believe that explaining the physical significance of any sort of expression requires a second-order explanation. Throughout this thesis our aim has been to justify this approach to language study by demonstrating its superiority to synchronic approaches that, contrary to reality, assume a static language. Overlooking change is not a harmless idealization; it significantly distorts the nature of the phenomena to be investigated. The type of research we advocate requires an eye for detail and should be conducted in such a way that its discoveries can be compared with those of other sciences. This bars it from making essential use of folk-vocabularies. The emerging theory should be phrased in such a way that as more is learned of the physical workings involved in language processing and production it can stand with the fewest possible retractions. These strong standards of hygiene stand it better stead than many of its philosophical competitors.
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