Carnap posited that the entire world was nothing but qualia, and while he very ingeniously began constructing it with just qualia, the same arguments that apply against the verification theory and reductionism apply here, and it fails.

Quine adopts the radically different perspective of naturalism, which attempts to figure out how we learn about the world as a priority and not making any posits of the sort Carnap made. Despite this radical shift in aim, however, Carnap's method of rational reconstruction is evidently greatly helpful. We begin with nothing but sense-data from the specious present (which is automatically systematized to some basic extent by processes Quine simply refers to as 'innately' learned). After a brief discussion on perceptual and receptual similarity, Quine describes the harmonization of dispositions due to natural selection.

The first things we learn are observation sentences. "(It's) Raining", "(It's) Cold", "Dog", etc. It is learnt ostensively, and is open to concurrence or denial from the linguistic community, making it intersubjective. Connectives and the like may also be ostensively learnt.

The next step is observational predication: "The dog is black"-not quite the same as just two observation sentences together, "Black dog" (which is equivalent to "Black and dog"). (Note that reification would only take place with the statement "*That* dog is black".)

There is, says Quine, a very big step after this ('I would like to know how it came about and how it is learned'): Observation categoricals. If-then statements; the first scientific laws we encounter. "When the sun rises, the birds sing." Observation categoricals can be handed down, while the other two have to be learned ostensively; they can be tested and confirmed or disconfirmed empirically.

We have reached this stage of learning, but we have not yet recognized objects. Next comes reification.

Now, the primitive observation categoricals are: "Whenever there is a raven, there is a black raven." If we modified this slightly to read "Whenever there is a raven, *it* is a black raven," we have achieved reification. We move from free observation categoricals with pronouns of laziness to focal observation categoricals with essential pronouns. Indefinite singular terms are the antecedent to essential pronouns.

Placing primary referential responsibility on the pronoun, Quine suggests regimenting our notation by using quantifiers to make the indefinite singular term involving, say, raven, "a component clause of the ensuing text", implying that we need only two indefinite singular terms: Everything and something. "All ravens are black" becomes "Everything, if it is a raven, is black."

With this notation, we need to resort to using variables in order to avoid ambiguity.

An alternative approach to quantification: Reading (something x)(is such that Fx) as, rather, (something is)(x such that Fx). This means recognizing an operator 'x such that' of predicational abstraction. [Note: Parallels to Church's lambda calculus' abstraction?] Predicational abstraction "confers predicational completeness: Whatever we can say about a thing can be said by predicating a predicate of it"; the two occurrences of the variable x here cancel out to give us just (something is)(F).

But wait: Why places primary referential responsibility on the pronoun at all? "Most things are not individually specifiable by name or description…. but all things are denoted by general terms. From

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either perspective, then, whether quantification or predicational abstraction, to be is to be the value of a variable."

"So much, then, for the logic of reification."

The next big development is strengthening reification in the temporal dimension; the principle of divided reference helps here. Quine then speaks briefly on the reification of abstract objects, and then on the need for classes.

(For all of the above, see: Word & Object.)

Subsequently, a brief but indirect exposition on his arguments against the verification theory and reductionism is given, calling observational categoricals the checkpoints of science.

On seeing an observation categorical to be false: "Rescinding any one would resolve that problem…but different choices issue in different new theories, one of which would withstand future tests better than another. It is a spot where the good scientist is distinguished by his shrewd guess."

(I feel this 'guess' itself also has mostly empirical roots. Evidence may point towards a certain observation categorical looking more susceptible to turning out to be false-although there does seem to usually be at least a little 'guesswork' involved here.)

"The simple schematism of observation categoricals and implication is remote from the experimental scientist's conscious practice. For logical implication to hold, we must admit among the premises various self-evident truths and familiar laws of nature that the scientist takes in stride quiet unconsciously." Again, the innate learning mechanism which teaches us perceptual similarity.

Quine suggests that tracking down the checkpoints for widely celebrated scientific theories such as Newtonian mechanics may be quite illuminating. I suppose he says this because he feels it will bolster the aforementioned 'guessing' abilities.

A sentence or a set of sentences which have critical mass imply an observation categorical and may be said to have empirical content. However, even a sentence without critical mass can be said to have empirical content if it is participatory in a set of sentences which do have critical mass in an indispensable way and thus imply an observation categorical.

However, all sentences imply observation categoricals, trivially, at least. We want to credit empirical content only to those sentences which themselves are and have or are part of an 'interesting' set with critical mass. Quine, however, sees no way to set up a rigorous standard for 'interesting'.

Quine notes that the normative of simplicity of theory governing phenomenological theories survives the conversion to naturalism due to the lack of a concrete criterion for deciding which theory would be simpler and how to find it.

How do we check whether something implies something else? "Put the premises and the negated conclusion into prenex form and then accumulate a truth functional inconsistency by persistent instantiation of the quantifiers." Brute forcing it, in a way.

Quine now distinguishes between logic and set theory.

Logic has no objects it can call its own, no real ontological commitments (see: On What There Is). It is an empty vessel, so to speak, unlike set theory, which would cease to exist by its very nature if it had no ontological commitments. (Notably, Quine calls set theory a *higher* branch of mathematics.)

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And so secondly: It follows that logic has no predicates/posits of its own (with the exception of identity).

The last one is the most interesting one. Logic, says he, admits of complete proof procedures, whereas set theory, due to Gödel's theorem, does not. It had struck me well before reading this that empirical content may be a way to bypass that deadly theorem; Quine seems to concur!

Quine now moves on to question what distinguishes mathematics from natural science.

Its lack of empirical content, of course. However, "there is no end of other equally infinite classes of truth which lack empirical content." What sets mathematics apart is it being a 'formalized language'. However, this isn't watertight either, for we can have trivial formalized languages. Quine concludes by calling mathematicity a matter of degree.

The chapter ends on an interesting note, with Quine essentially saying that despite Gödel's limitation, we must "make our peace with the situation" by conceding that all statements can be considered to have a truth-value regardless of whether or not we may know it, and that the existence of this truth-value "is indifferent both to our working conceptual apparatus and to nature as reflected in observation categoricals". (Anti-analogy: Gödel's limitation represents a limitation of our knowledge and not the lack of existence of a truth-value/Superposition state represents not a limitation of our knowledge but the lack of existence of a truth value.)

Designation is reference by a singular term, and can be reduced to denotation, which is reference by a general term (by a general term being true of only one thing), although singular terms are used due to their convenience.

Quine clarifies that denotation refers not to the class of all things it is true of but rather of each separate thing of which it is true.

n-place predicates may be represented by ordered pairs/triplets/etc. (Quine briefly shows how they can be construed as classes.)

However, denotation falls prey to Grelling's paradox despite the fact that we have done little to define it, even without any reified objects. The phrase 'not denoting itself' denotes itself if and only if it does not denote itself. "For all its seeming modesty, the disquotation requirement is too immodest for complete fulfilment."

If we define denotation only for predicates constructible from basic ones by predicate functors and do not include 'denote' itself in the basic ones, we escape the paradox, although our definition of denotation itself is now incomplete. Or we can construct an endless hierarchy by defining 'denote 1' as a basic functor and using 'denote 2' to denote it and so on and so forth.

Quine now points out that there is no clear set of basic functors in ordinary practice, although Grelling's paradox still does apply.

"Denotation, then, stretches in two dimensions. There is the vertical dimension of hierarchy, and there is the horizontal dimension of length of denoted sequences."

Typically, an n-place predicate denotes an n-place sequence if and only if it is true of it; and a no-place predicate thus reduces to truth outright. "Truth…is just a degenerate case of denotation."

Much like denotation, truth is also susceptible to paradox and must climb up a hierarchy.

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Disquotation has made truth seem trivial, for no-place predicates are trivially true. "Far from triviality, disquotation determines truth uniquely"-If two predicates both fulfil disquotation, they are coextensive.

"The function of identity is recurrence in discourse."

Quine briefly gives his thesis on indeterminacy.

"Ramsay's treatment...brings out indeterminacy of reference not by reinterpretation, but by waiving choice of interpretation." This can work only for abstract objects and not concrete, however- "endurance and identity over time are essential" to them. What matters, however, is not what they are but how they fit into our overall theory.

Moving onto meaning from reference, now. The indeterminacy of translation should not affect equations of sentence meanings, for the application of proxy functions does not change truth conditions.

Sameness of meaning, adds Quine, consists of having a speaker's "disposition to give the same verdict to both sentences on any and every occasion".

This works for occasion sentences, at least; for standing sentences, "it comes down to tacit and unsystematic correlations."

Causal regularities can induce standing sentences on misty ideas and unitary entities. The ghost in the machine. [Consciousness/the self?]

Now coming to sameness of meaning between sentences across different languages: Moving on from occasion sentences (the easier part), standing sentences may not only face the problem of multiple translatability but also lack a standard of sameness of meaning itself; for example, 'Neutrinos have mass' is untranslatable into the English of the 1930s.

Quine emphasizes on the fact that it is not translation but interpretation that is the linguist's final goal. Untranslatable sentences ('Neutrinos have mass'-or, perhaps, in the case of a tribe, statements and theories about their Gods?) can be *interpreted.*

In dictionaries, too, one word is broken down into several meanings merely to enable the reader to communicate practically and not convey the meaning in any theoretical sense. (Quine's tendency to banish meaning as an abstract entity would be with people who have read any of his other significant works!)

Dualism in substances has evolved into dualism in language, wherein some predicates are mentalistic and others, physiological.

Quine compares reducing the mental to the physical to reducing arithmetic to set theory. Are we explaining or explaining away?

The former for the former and the latter for the latter, says he; he appears to be a physicalist, having a stance not very much unlike that of John Searle's on the matter. This is probably the only stance of his that I find myself unwilling to fully agree with. (Especially since I had previously thought of logic as the result of a 'conscious' system and set theory as result of an 'unconscious' mathematical system making the difference between these two and the other two the same...)

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A brief exposition on intensionality and extensionality is given, followed by a mention of a suggestion of a possible bridge across intensionality and extensionality; in effect by turning the attitudinal sentence into a sentence of a theory regarding the attitudes of the man in question.

We cannot, however, reify beliefs as specific sentences, although Quine seems to insist that we can identify them only as sentences and not some other metaphysical vagaries. And so he suggests identifying it (later, along with conditionals and the modal logic of necessity) as useful outsiders to science. (He does, however, mention a construction by a Burdick which would submit it to extension.)

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