Why *I* am Not a Nominalist[1]
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1/3 Draft
do not quote or even think about too much

Nominalists think there are no mathematical objects, henceforth, "numbers." Here is how the debate about nominalism has sometimes been presented. First there's the argument AGAINST, credited to Quine[2]: numbers are indispensable to natural science, hence they exist. Then there's the argument FOR nominalism: they are not (indispensable) either; lacking a reason for thinking they exist, we conclude that they don't. It seems to me this gives a doubly misleading account of the dialectical situation. It misrepresents both the Quinean argument and the form a proper response would take.

One problem is to see how Quine is giving an argument <u>for numbers</u>. An argument for numbers would presumably be an argument whose conclusion was "there are numbers." I can certainly imagine an indispensability argument with that conclusion (and perhaps some have interpreted Quine to be arguing in this way).

(1) Numbers are indispensable.
(2) The best explanation is that they exist.
(3) So, by argument to the best explanation, there are numbers.

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[1] After John Burgess's paper of the same title. See also "Mathematics and Bleak House" and (with Gideon Rosen) "Nominalism Reconsidered."
[2] And Putnam. But let's stick to Quine.

But this is not what Quine is saying, and a good thing too. Why it's not what he is saying will be discussed in a moment. Why it's a good thing is that the argument is not persuasive. It assumes (a) that the existence of numbers does or would explain indispensability, and (b) no other decent explanation is available. And both assumptions seem debatable.

Regarding (a), how is the explanation supposed to go? The failure of repeated attempts to reconstruct physics on a nominalistic basis would seem to be a natural phenomenon. Usually to explain a natural phenomenon one cites a cause of that phenomenon. The indispensability of electrons does seem to be caused in part by electrons. Electrons "make themselves indispensable" by leaving macro-traces so pervasive as to foil any attempt to reconstruct physics on an anelectronistic basis. Numbers do not seem to "make themselves indispensable" in this way: by leaving traces hard to account for on any other basis. Their existence, assuming they exist, is not what prevents nominalistic reconstruction. It would not be a sign that the numbers were gone if the reconstruction program suddenly racked up a string of successes.[3]

Regarding (b), indispensability would seem to admit of other explanations. Numbers facilitate prediction, calculation, representation, theoretical speculation, efficient theory-revision, etc., and are so helpful in these capacities that nothing like existing science could be carried on w/out them. Conferring these advantages does not requires numbers to exist, no more than the man in the moon has to exist to facilitate discussion about the moon. So
"facilitating prediction, etc." is a <u>different</u> explanation to the one

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[3] It might be suggested that the hypothesis of their existence "explains" indispensability in the purely epistemic sense of making it less surprising or remarkable. But the only way I can see for the existence of so and so's to make a natural phenomenon less surprising is for so and so's to figure in the causal background to the phenomenon.

that says that numbers exist. I would go further and call it a
<u>contrasting</u> explanation, since it shows why scientists might have
been moved to invent numbers and why the invention would have
caught on.

Back to the issue of whether (1)-(3) is the true Quinean argument,
if it were, you would expect to find in his writings a review of
possible explanations of indispensability, and an attempt to show
that the number explanation works best. There is none of that in
Quine. His emphasis is more on commitment: our theories are
committed to numbers and we are committed to our theories and
commitment seems in this case to be a transitive relation. This
suggests that Quine is not purporting to tell us why we should
believe that there are numbers. His point is rather that (while we
may attempt to deny it) we already <u>do</u> believe there are numbers,
by virtue of believing mathematical physics.

That can't be his only point, of course, because so far Quine has
not given us a reason to reject nominalism, just a reason to feel
intellectually dishonest if our embrace of nominalism has not led
us to give up mathematical physics.   His second point is that our
belief in mathematical physics is by any ordinary standard
justified, and to suppose that that justification could be shaken by
philosophical worries about abstract objects is a joke.   Here is the
position laid out more fully:[4]

> (1) Physics (e.g.) abounds in statements that appear to assert
> the existence of mathematical objects.

> (2) Expert physicists accept these statements in the sense
> both that they assent verbally to them without conscious

[4] The argument in the text is adapted from Burgess and Rosen, "Nominalism
Reconsidered" Their science of choice is mathematics rather than physics. I agree that
makes or could make a big difference. See Maddy, "Three Kinds of Naturalism."

silent reservations, and that they rely on them in both theoretical and practical contexts.

> (3) The statements are not merely <u>accepted</u> by the experts, but are <u>acceptable</u> by the standards of physical science.

This much is meant to be uncontroversial. The next premise, a crude naturalism, will not be controverted here either.

> (4) If expert scientific opinion holds that S, then the belief that S is justified; nothing philosophers say can cast doubt on the opinion of science.

The argument picks up from (3) as follows.

> (5) The statements (really) do say just what they appear to, so inter alia that there are mathematical objects.

> (6) There is no more to believing what a statement (really) says than accepting it the sense of assenting verbally to it without conscious silent reservations, …

From (1)-(3), (5) and (6), we infer that

> (7) Expert scientific opinion holds that there are mathematical objects.

From (7) together with (4), we see that

> (8) Belief in mathematical objects is justified.

Notice that indispensability plays no role in this argument at all. You may say it assures us that (1) is going to <u>stay</u> true; physics is going to <u>keep on</u> abounding in statements that appear to assert the existence of mathematical objects. But are assurances really

needed? An otherwise comparable nominalistic alternative has no chance unless physicists see the dalliance with mathematical objects as problematic and irksome. And their attitude is insouciance bordering on absolute indifference. For the same reason a denial of indispensability doesn't particularly threaten (1). Physics is not going to stop abounding in statements that appear to assert the existence of mathematical objects any time soon.

Since (1)-(8) is not happily described as Quine's indispensability argument, let's call it (given the central role played by (4)) Quine's naturalistic argument. The consensus appears to be that Quine's naturalistic argument is the best available defense of platonism against nominalism. If I were now to tell you that I agree with that consensus, and that I myself reject nominalism, and for naturalistic reasons, you could be forgiven for thinking that I reject nominalism because Quine's naturalistic argument. But you'd be wrong (I am sure you'd get over it). I have two big worries about the argument. Both are variations on the theme of a little naturalism is a dangerous thing.

First big worry. I sense an equivocation on "really" between (5) and (6). If "really" means "literally", then (5) is true but (6) is debatable. If "really" means "as opposed to apparently," then (6) is true but (5) is debatable. That is, the statements assert the existence of mathematical objects taken literally, but unreserved acceptance of a statement suffices at best for belief in what it really as opposed to only apparently says in the context at issue.

I submit, for instance, that when Bill Gates assents verbally to "the competition is killing us", it is with the opposite of conscious silent reservation. His unhesitant reliance on this statement in theoretical and practical contexts is a matter of record. The statement really (literally) does say that the competition is in the process of ending our lives. But is the belief Gates expresses when he accepts the statement to the effect that the competition is ending our lives? I

doubt it. The belief he is expressing is what the statement really (as opposed to apparently) means in his mouth in that context, viz. that we are losing market share (or whatever).

Could something like this be going on in the case of interest, mathematical physics?   I am told that when Clyde Tombaugh discovered Pluto in 1930, he said "Doggone, the number of planets isn't 8, it's 9." This sentence "really" (literally) affirms the existence of the number of planets. But did Clyde Tombaugh in uttering the sentence express the <u>belief</u> that there is such a thing as the number of planets?

Maybe he did. I see no reason to doubt that platonistically inclined physicists do, or may, express a belief in numbers when they say "#P = 9."   But it would be strange if this were a requirement on physicists as such, for then nominalists could not in consistency practice the trade of physics. (Or at least they could not practice it in the ordinary way. They could I suppose draw equivalent duties as conscientious objectors: the substitute work would be like regular physics except for the stopping at regular intervals to register conscious silent reservations.)

Tombaugh <u>would</u> arguably be falling short of his responsibilities as a physicist if he was the 1930s equivalent of a moonwalk skeptic and took Pluto and every other so-called planet to be an elaborate hoax. But Tombaugh does not seem to be misbehaving as a physicist – it does not even make him a black sheep or dissident physicist -- if he does not express by "#P=9" a belief in numbers because he lacks the belief.

But perhaps we are asking the wrong question. Why should it matter what Tombaugh could get away with if he were for some reason a nominalist? What matters is the belief physicists <u>do</u> express, whether this is required or not. Suppose then that Tombaugh and all the other experts are committed platonists. I

concede that it might well be true that in uttering sentences like "#P=9" they are giving voice inter alia to their platonism. Assume for argument's sake that

> (7') Expert scientific opinion treats as true sentences that are used by many or all experts to express inter alia their belief in numbers.

But (7') is still a ways short of (7): expert scientific opinion holds that there are numbers. To see why, imagine the experts are also convinced that numbers are ideas in the mind of God. Then it would seem that

> (7") Expert scientific opinion treats as true sentences that are used by many or all experts to express inter alia their belief in God.

I take it that we don't want to conclude from (7") that expert scientific opinion supports theism. Expressing a belief in God by this route is something the experts do on their own time, as it were, not in their capacity as scientists. Expert scientific opinion's endorsement of the sentence should not be construed as its endorsement of whatever this or that individual might intend by the sentence. Similarly, expert scientific opinion's endorsement of "#P=9" should not be construed as endorsement of whatever that sentence might be used to express. Whether the endorsement carries over has to considered in its own right.

It would help if we had an account of "expert scientific opinion holds that p" in terms of the practice of individual scientists. It is not enough, apparently, that scientists qua scientists find S acceptable while at the same using S to express their belief that p. But then what do scientists have to do with S to make it the case that ESO (expert scientific opinion) holds that p?

Imagine that I am told by a reliable source that the shortest spy is bald. I am privately persuaded that the shortest spy is Ralph J. Ortcutt, so to me this means that Ortcutt is bald. Later, back at Langley, I am asked whether I know of any bald spies. In reply I say, "well, the shortest spy is bald," musing internally on an image of Ortcutt without any hair. Have I expressed to the tribunal the view that Ortcutt is bald?

It seems to me we are pulled two ways on this. On the one hand YES, because the two propositions are for me interchangeable. On the other hand NO, because I would never present in that context a view for which I lack evidence, and this idea of Ortcutt being the shortest spy is my own private hunch. This suggests hat two notions are run together in talk of expressing one's view:

> I express my <u>belief</u> that <u>p</u> in uttering S iff
>   I put S forward as true,
>   while taking it to be true
>   thanks (in part) to the fact that <u>p</u>.

> I express the <u>judgment</u> that <u>p</u> in uttering S iff
>   I put S forward as true,
>   on the understanding that whether it is true
>   depends (in part) on whether or not <u>p</u>.

I may in my debriefing express my <u>belief</u> that Ortcutt is bald. But I do not render any <u>judgment</u> to that effect; the only judgment I render is that the shortest spy is bald. (Rendering a judgment is just alternative language for expressing a judgment.) The proposal is that

> ESO (expert scientific opinion) holds that <u>p</u> iff experts render in that capacity the judgment that <u>p</u>.

They must not only put S forward as true but do so on the understanding that they are speaking falsely if it is not the case that p.

Applying this to the case at hand, does Tombaugh qua expert scientist put "#P = 9" forward as true <u>on the understanding that its truth depends on the existence of numbers</u>?   Evidently not. Tombaugh does not set himself up as an expert in mathematical metaphysics. His field is astronomy and he means to be rendering a judgment only about planets. He would be horrified to find himself cited on behalf of one side or the other of the number debate, or to learn that his students were placing ontological bets based on his pronouncements in lecture. The journals to which he submits his work do not return it for clarification of how seriously he intends the references to numbers. If expert scientific opinion takes a position on numbers, it has done a good job of hiding it.

By this point you may be thinking that the paper has been mistitled. The idea that uttering "the number of planets is 9" commits Tombaugh the planets, but not the number that measures them cardinality-wise, sounds like what Burgess and Rosen call "hermeneutic fictionalism." HF is in their taxonomy a kind of nominalism that (unlike the revolutionary kind) doesn't demand any changes in how we talk. It lets us keep on uttering sentences seemingly about numbers on the theory that what we mean by these sentences has nothing to do with numbers. All Tombaugh is really committed to when he utters a statement S of mathematical physics is that our world is in concrete respects S-ish. If scientists won't render the judgment that there are numbers, why should you and I? The title of the paper should be "Why I <u>Am</u> a Nominalist."

But this is not right For all we have said so far, scientists are just as reluctant to render the judgment that numbers do <u>not</u> exist. If they will not take a stand against numbers, why should you and I? It would not be fair dealing to say that absent a positive reason for

believing in numbers, we should let them go, If we are going to go along with the naturalist in rejecting "first philosophy," that affects philosophical arguments against numbers as much as philosophical arguments for them. "Absent a positive reason we should let them go" seems to rest on a first-philosophical abhorrence of abstract objects, or perhaps a first-philosophical application of Ockham's razor. These arguments can claim no support from expert scientific opinion. ESO does not appear to assign <u>any credit at all</u> for reducing abstract commitments. Perhaps this is because ESO appreciates at some level that there is less to these commitments than meets the eye.

(An irony of the situation may be noted. It was supposed to be <u>helpful</u> to nominalism to argue that science is not committed to numbers; certainly it's the nominalist who mostly advocates this argument. But this turns out to be a misunderstanding. What the no-commitment claim <u>does</u> do is block the standard naturalistic argument for platonism, the so-called indispensability argument. For just this reason, though, it also pulls the rug out from under the standard naturalistic argument for nominalism, viz. that science teaches the value of reducing ontological commitments. That science teaches the value of reducing ontological commitments gives a reason for ditching numbers only if they <u>are</u> ontological commitments, and the nominalist was just congratulating herself that they aren't.)

The point to take away from this is that there is no logical reason why hermeneutic fictionalism should be in the service of nominalism. Logically speaking there are just two separate issues here. The ontological issue is: Are there numbers? The hermeneutic issue is: does "the number of planets is 9" carry a commitment to numbers? One could answer NO to the second question and YES to the first. That a given sentence doesn't commit us to numbers hardly entails that numbers don't exist.

Burgess might say: granted the technical point, what does it matter in practice? What motivation other than nominalism could one have for being a hermeneutic fictionalist? This seems a funny question for a naturalist to be asking. Before we can acquiesce in the findings of science, we need to know what those findings are; we need to know what scientists qua scientists are saying. And that is a job for the hermeneuticist. The reason we need a hermeneutic <u>fictionalist</u> is that there are puzzles about what scientists are saying that lend themselves to hermeneutic fictionalist treatment.

For example: on the one hand, it doesn't seem right that we are bound to be talking about numbers if we without silent reservations utter "the # of planets = 9." Disavowing any reference to numbers is not ipso facto doublethink, as platonists have sometimes suggested. On the other hand, the nominalist must be wary of swinging too far in the other direction, making it impossible for a suitably minded scientist to mean by that sentence what it literally says. On the <u>third</u> hand, as if we didn't have trouble enough, we expect everyone uttering a sentence to be in some good sense saying the same thing. How do we reconcile

> (A) Godel takes himself to be talking about numbers when he utters "#P=9".

> (B) Field takes himself to be talking only about planets when he says "#P=9".

> (C1) Godel and Field mean to be saying the same thing, and they mean for this to be so regardless of how the philosophy comes out, and

> (C2) They succeed in saying the same thing, and this is so regardless of how the philosophy comes out. .

The best way of reconciling (A)-(C) that I can see makes use of the belief vs. judgment distinction from above:

> I express my <u>belief</u> that <u>p</u> in uttering S iff
>> I put S forward as true,
>> while taking it to be true
>> thanks (in part) to the fact that <u>p</u>.

> I express the <u>judgment</u> that <u>p</u> in uttering S iff
>> I put S forward as true,
>> on the understanding that its truth
>> depends (in part) on whether or not <u>p</u>.

A third notion should be mentioned here too::

> I express the <u>fact</u> that <u>p</u> in uttering S iff
>> I put S forward as true,
>> and it is true
>> thanks (in part) to the fact that <u>p</u>.

These distinctions allow (A)-(C) can be true together:

> (A') Godel expresses his belief in numbers by "#P=9", that is, he puts the sentence forward as true while believing its truth is owing in part to numbers.

> (B') Field does not express a belief in numbers by "#P=9", that is, he puts the sentence forward as true while denying its truth is owing in part to numbers

> (C1') Godel and Field mean to be rendering the same judgment -- they intend that if one represents S's truth as hinging on the fact that <u>p</u>, the other does as well – and expressing the same fact – if one's statement is true because of <u>p</u>, then so is the other's...

(C2') They do express the same judgment, for Godel the mathematical physicist is not in that context rendering a judgment about numbers. He puts "#P = 9" forward as true, and he thinks it is true because of 9, but he is not holding the statement to that standard. They express the same fact either platonism holds and the sentence is true in both their mouths thanks to the identity of 9 with #P, or nominalism holds and it is true in both their mouths thanks only to there being nine planets.

Admittedly this is more of a wish list than a theory of what is actually going on. It would be nice if (A') – (C') could be exhibited as the natural upshot of the kind of speech act Godel and Field are performing when they say "#P=9."

I take it that everyone has encountered, and some may even have used, the suffix "literally and figuratively." I did a Google search and came up with 48,000 or so instances.[5] One interesting effect of the suffix is that it heightens interest in and sensitivity to the literal/figurative distinction. It does this by forcing us to consider how the distinction applies to the sentence at issue, the one it is attached to. One has to find a literal reading and a figurative reading in full consciousness of the fact these readings are different.

Now, "literally and figurally" is as linguistic devices go pretty peripheral: somewhere out there with punning and other forms of double entendre. It is not as though there is any great linguistic economy in packing both sorts of message into a single sentence. What would be useful in many contexts is a device that

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[5] One excellent source is the show SpongeBob Squarepants, which prides itself on its lame humor. For instance if Patrick falls into a pit, SpongeBob will say "You are in a deep hole, my good man, <u>literally and figuratively</u>."

desensitizes us to the literal/figurative distinction and encourages us not to bother ourselves about how it might apply to the given sentence. Further investigations with Google reveal that a device like this does exist, namely "literally or figuratively." It seems to be particularly common in dictionaries, in entries like: "up: from a lower to a higher position, figuratively or literally." A variant form more common in everyday speech is "figuratively if not literally," as for instance in "their nuclear arsenal is rusting away, figuratively if not literally."

I call this device useful because it lets us convey what matters without forcing us into positions on issues that (a) we are not yet in a position to address, and/or that (b) we see no point in addressing, and/or that (c) do not appear to admit of determinate resolution.

An example of (a) is this. Imagine that we are living in the days of Newton and Leibniz. If Newton is right then space is a "thing," if Leibniz is right then it's a facon de parler, a way of organizing talk of spatial relations. None of that is our present concern, however. Our problem right now is that the gondolier seems to be taking an unnecessarily roundabout route to St Peters Square in order to jack up the fare. "Have you forgotten," we say, "that a straight line path is the shortest?" It would be strange if we meant here to be committing ourselves to the sentence's literal truth, because the sentence taken literally concerns spatial paths, and it is controversial whether there are any such things.   Neither though do we want to definitively back off from the literal reading. Spatial paths might be real and if so we are content to be regarded as talking about them. What we meant to be saying, it seems, is that a straight-line path is shortest, etc., figuratively if not literally. This signals that we are saying of the straight paths that they are shortest if they exist, otherwise that unless a thing goes straight to its destination it travels further than necessary.

This last might also be taken as an example of (b) but here is a different example (thanks to Jamie Tappenden).   If you read Nixon Agonistes, Gary Wills's book about our 37th President, you will find it hard not to conclude that Nixon had a stunted superego. Unfortunately, you don't know whether Freudian psychodynamics is correct, or correct enough, for this to be taken literally at no cost to its truth. Fortunately you don't care either, since to assert the existence of superegos was no part of your plan. To finesse these issues you can say that Nixon had a stunted superego, figuratively if not literally. This signals that you are content to be regarded as having remarked on the character of Nixon's superego if he has one, but you are not proposing to abandon the remark if he doesn't. What you are saying in that case is that Nixon was remarkably unbothered about engaging in morally outrageous behavior.

An example finally of (c). The dictionary tells us that to move up is to move to a higher position, literally or figuratively; let's assume the intention is that a thing moves up literally or figuratively according to whether it literally or figuratively moves to a higher position. Now it would be unfortunate if Lou Dobbs had to take a view on whether Dow 7600 was literally higher than Dow 7500 before he could tell us that the stock market went up today. Not only does he have enough on his mind, there would be the possibility of his getting it wrong and asserting "The Dow Jones went up today" in a literal spirit when it was literally false, or a figurative spirit when it was literally true. You might think that this possibility is not to be taken seriously, because the boundaries of the literal are not that determinate. But this in some ways only deepens the problem because now Dobbs is (half) wrong whatever he decides. Either he asserts in a literal vein a sentence that is not-determinately-not literally false, or he asserts in a figurative vein a sentence whose claim to figurative truth is similarly compromised. The proposed way out is for Dobbs to tack

on "figuratively if not literally" or "figuratively if necessary" or words to the same general effect.[6]

So much is to suggest that a "figuratively if necessary" operator – for short a _finess_ operator – would in various contexts come in awfully handy. It has to be admitted, though, that this operator is not much in evidence in everyday speech. Lou Dobbs for one seems to get along fine without it. No one expects him to issue an explicit reminder that whether the market _literally_ went up today is neither here nor there. It might be argued that the operator is there but unspoken – after all, it is clear to all concerned that Dobbs does not mean to be associating himself with any particular view about the extent of literal upness.   Even this, however, would seem to attribute one thought too many.   It is one thing to say that Dobbs does not mean to be associating himself with a view about the extent of literal upness, another to say that he takes positive steps to _dissociate_ himself from any such view.

Is this carelessness on Dobbs's part? One might think that he _should_ remark at least to himself on his openness to a figurative interpretation, even if he is forgiven when he forgets. However to call the usage careless suggests that Dobbs leaves himself open to a certain kind of criticism -- "how can you say that, when it might for all you know not be literally true?" – whether or not anyone would bother to level the criticism. And that seems wrong too. Dobbs does not need to _do_ anything to ward off the presumption of literal-truth-or-bust. The shoe seems if anything to be on the other foot..   If our attitude is literal-truth-or-bust, we should say, "the stock market went, and I mean to be taken literally here folks, _up_ today," or "Nixon had, and not just in a wishy washy metaphorical sense, a superego that was stunted." (Wittgensteinian analogy for those who don't hate Wittgensteinian analogies: it can

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[6] This is of course not a full explanation. I am thinking of the analogy with "_x_ is red if not pink" when _x_ lies on the red/pink border.

seem as though you should say "stand <u>roughly</u> there" if you are not insisting on a precise location," but on the contrary it is when your intentions are precise that you need to stick in an extra word: "stand precisely there.")

Where does this leave us? No doubt there is <u>something</u> to the idea that sentences are other things equal to be taken literally. But we take the idea in an implausibly flat-footed way if we insist that the literal reading is correct unless and until the speaker does something positive to dislodge it.

The flat-footed interpretation <u>appears</u> to be supported by a widely held picture of what is involved in understanding a language. The picture I am thinking of puts grasp of a recursive semantics at the core of understanding, and posits a mixed bag of non- (or less-) recursive devices, often of a pragmatic nature, to extend core understanding to whatever remains. A sentence's literal meaning is the one assigned by the recursive component. When the non-recursive devices kick in, we get non-literal meanings. This might seem to suggest that non-literal meanings are reached by pushing aside previously assigned literal meanings, hence that a sentence's "real" meaning is literal unless and until something knocks the literal meaning aside.

I am not sure how strongly these conclusions <u>are</u> suggested, but they appear in any case to be empirically wrong. Raymond Gibbs after a review of relevant studies says that psychologists have been led to

> make two related claims about figurative language comprehension…
> 1. Comprehension does not take place in three distinct stages [assigment of literal meaning, rejection, search for figurative meaning]. Figurative language interpretation does not follow after an obligatory literal misanalysis.

2. Identical mental processes drive the comprehension of both literal and figurative utterances (PM, 109).

Gibbs speculates that one reason philosophers and rhetoricians find this hard to accept is that they

> they confuse the <u>processes</u> and the <u>products</u> of linguistic understanding…Although people might on some occasions be able to identify figurative language as being distinct from literal language, this conscious judgment is based on a late product of linguistic interpretation and should not be taken as evidence regarding the …psychological processes by which figurative language is ordinarily comprehended. …[the] phenomenological awareness of literal meaning refers to the late products of linguistic understanding, not to early and unconscious understanding processes (115),

You may say that if the literal-meanings-first view is wrong, then a lot else is wrong, for it falls out of the standard picture of linguistic competence as consisting of a recursive component and a mixed bag of non-recursive extensions. But once again, I am not sure the literal-meanings-first view <u>does</u> fall out.

What the standard view does clearly do is break semantic competence down into two components. But it goes further than this to insist the two components operate in sequence. It is not even clear that the two components have to correspond to distinct mental mechanisms. They might be <u>vector</u> components teased apart by theorists because the forces driving interpretation are usefully conceived as their resultant.   (Just as it might be useful in thinking about the forces acting on water particles in a river to separate out the steady downriver component from the component pushing sideways towards one of the banks.) I sense a similar idea in Scott Soames's comments on Grice's version of the literal-meanings-first model:

When we apply this model to actual speaker-hearers, we should not think of them as explicitly appealing to Grice's maxims, or as reproducing the reasoning used in the model; rather, we should view them (i) as attempting to exchange information cooperatively and efficiently and (ii) as succeeding at this by virtue of the fact that the information they do extract, and expect others to extract, conforms to the model. What psychological mechanisms are causally responsible for their ability to do this is not a matter for a priori theorizing (BR, 59-60, see also Thau, chapter 4, Recanati, ch 13ff).

One needn't agree with the details of this to appreciate that plotting real meaning against literal meaning x and "adjustment" y is not saying that <u><x, y></u> is reached by first traveling x units across and then y units up.[7]

A meaning's status as literal has to do not with its role in the causal construction of meaning but its role in a certain type of rational reconstruction. This could hardly be considered a definition, but the idea would be that

> (*) S taken literally means that p just if p is assigned to S by the first, recursive, component of a semantic engine whose second component uses the output of the first as a basis for the determination of any meanings not yet assigned.[8]

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[7] Possible analogy with grammaticality. The usual account is through recursive rules defining pure or "literal" grammaticality and a mixed bag of add-on rules setting out allowable deviations from the pure case. This makes sense independently of whether "They what the car?" is found acceptable after and because "They wrecked the car?" was found acceptable.

[8] This should make it less of a mystery why there can be no precise line between literal and figurative. A precise line goes with a best possible division of labor between core semantics and correction mechanisms. But the factors determining bestness are not neatly commensurable. One obvious tradeoff is beween the simplicity of the recursive

If (*) is right then we begin to see why an explici finess operator might not always be needed. (*) justifies all by itself the expectation that speakers are to be taken literally if possible and figuratively if necessary. They are to be taken literally if possible because their utterances are more comprehensible, other things equal, when interpreted in accord with a recursive semantics. They to be taken figuratively if necessary because other things are <u>not</u> equal if the drive for systematicity leads us to impute inexplicable error, counting as false sentences that speakers agree are true. Better to lighten up on systematicity than attribute to me the belief that I can still have butterflies in my stomach even in the absence of insects, even though butterflies are a kind of insect. Better to lighten up on systematicity than attribute to me the belief that the number of planets can still be 9 even in the absence of abstract objects, even though numbers are a kind of abstract object.

This is relevant to Burgess and Rosen's claim that "whenever a bit of language is used non-literally, it is possible for an interlocutor to misconstrue it by taking it literally, and for the competent speaker to recognize this misunderstanding and correct it by point out that the remark was not meant literally. Certainly in all <u>clear</u> cases of figurative language — and it is worth stressing that the boundary between figurative and literal is as fuzzy as can be — the non-literal character of the linguistic performance will be <u>perfectly obvious</u> as soon as the speaker is forced to turn attention to the question whether the remark was meant literally" (NR, 22). They submit that "mathematical discourse fails this test." If you asked how the butterflies made their way into my stomach, I'd explain that the butterflies are pretended or a figure of speech. But what

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component and the ability of the second to satisfyingly account for any remaining meanings. (Grice came to worry that the implicature strategy by explaining everything would up explaining nothing.) Economizing on literal meanings trades these values off in one way, proliferating literal meanings trades them off in another.

would I say if you asked, apropos of the number of planets' being 9, "where is this number? what is it like intrinsically?"

Burgess and Rosen have me responding , "Hold on, you're getting me wrong…I didn't mean to say literally that numbers existed," and they observe that a likelier answer is "Numbers aren't like that." I agree that this is a likelier answer, and agree that it may not be open to someone determined to hear number talk as figurative. But it is the response you would expect if "#P=9" is finessed, that is, figurative if necessary. Numbers are indeed not like that – for if they exist, they don't have much in the way of location or intrinsic nature, and if they don't exist, they aren't to be imaginatively credited with such properties.   Compare asking Gary Wills what color Nixon's superego is. He doesn't reply, "what? it's just a figure of speech," but "superegos aren't like that." Still in saying "Nixon had a stunted superego" (he may be meaning to talk about superegos but) he is not committing himself to superegos.

I have been suggesting that nominalism and platonism take the issue of numbers' existence too seriously. This is especially so from a naturalistic perspective. Neither shows what physicists (qua physicists) would consider an appropriate degree of insouciance about mathematical ontology.   I have also been saying that fictionalism and literalism take the issue of the proper interpretation of number-talk too seriously.   The appropriate attitude is again insouciance: don't know and don't care, and come to think of it, don't really see that there's an issue here.

There is a big difference, however, between "don't know, don't care" and "no issue," and we have yet to argue that the second response is in order.   Is our insouciance justified on practical grounds or does it reflect a genuine lack of factuality in the questions?

"Is there an odd number of planets?", to be interesting, has got got to be understood as the question of whether there is <u>really</u> a number of planets, Otherwise the answer will be YES even in the absence of numbers, just in virtue of the fact that either there is one planet or there are three planets or etc. So we need to think about this word "really." Its function according to Gareth Evans is to boot us out of whatever as-if game we might be engaged in so that we can assess the remainder of the sentence for (not as-if truth) but <u>truth</u>.

> 'Really' is a word which, when prefixed to a sentence [S], produces a sentence [that] is true, absolutely, if and only if [S] is itself such that there is a proposition expressed by it when it is uttered as a move in the relevant game of make-believe, and this proposition is true (absolutely) (370).

Suppose that I take Zina to a play. She points at a figure on stage and asks: "Is that awful man there really the Prince of Denmark?" The answer is NO, because the proposition we make as if to assert when we say" that awful man is the Prince" is only make-believedly true, not true simpliciter. Her next question is, "Does Hamlet really have a stutter?" The answer is YES if what we pretend to assert, namely that that man has a stutter, is true all pretense aside, that is if the actor has a stutter. .

What does this tell us about whether there is really, say, an odd number of planets? If we think of figurative utterances as moves in an as-if game, then the operative notion of truth all pretense aside is just literal truth. Thus

> (1) Whether there is really an odd number of planets depends on whether it is literally true that there is an odd number of planets.

Naturalism tells us that science is the ultimate arbiter, so

(2) Whether it is literally true that there is an odd number of planets depends on whether "There is an odd number of planets" is scientifically acceptable on a literal interpretation.

The sentence is certainly scientifically acceptable, so the question is one of proper interpretation:

(3) Whether it is literally true that there is an odd number of planets depends on whether "There is an odd number of planets" is in scientific contexts to be taken literally.

Given our assumption that numbers' existence is finessed,

(4) Whether "There is an odd number of planets" is in scientific contexts to be taken literally depend on whether it is literally true that there is an odd number of planets.

Since science is the ultimate arbiter,

(5) Whether it is literally true that there is an odd number of planets depends on whether "There is an odd number of planets" is scientifically acceptable on a literal interpretation.

And this is just (2) again. We seem to be caught up in a circle

whether there is really an odd number of planets depends on whether S is literally true depends on whether S is scientifically acceptable on a literal interpretation depends on whether S is to be taken literally in scientific contexts depends on whether S is literally true etc….

This suggests to me that naturalism doesn't (as Burgess thinks) argue for platonism, and doesn't (as Burgess's hermeneutic

fictionalist thinks) argue for nominalism. Naturalism argues that there is no fact of the matter either way.