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Conceptual Engineering or Revisionary Conceptual Analysis? The Case of Russell's Metaphilosophy Based on *Principia Mathematica*'s Logic

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Abstract
Conceptual engineers have made hay over the differences of their metaphilosophy from those of conceptual analysts. In this article, I argue that the differences are not as great as conceptual engineers have, perhaps rhetorically, made them seem. That is, conceptual analysts asking 'What is *X*?' questions can do much the same work that conceptual engineers can do with 'What is *X* for?' questions, at least if conceptual analysts self-understand their activity as a revisionary enterprise. I show this with a study of Russell's metaphilosophy, which was just such a revisionary conception of conceptual analysis.

Résumé
Les ingénieurs conceptuels ont fait la part belle aux différences entre leur métaphilosophie et celles des analystes conceptuels. Dans cet article, je soutiens que les différences ne sont pas aussi grandes que les ingénieurs conceptuels l'ont laissé entendre, peut-être de façon rhétorique. En fait, les analystes conceptuels qui posent des questions « Qu'est-ce que *X*? » peuvent faire à peu près le même travail que celui que les ingénieurs conceptuels peuvent faire avec les questions « À quoi sert *X* ? », du moins si les analystes conceptuels comprennent eux-mêmes leur activité en tant qu'entreprise de révision. Je le montre avec une étude de la métaphilosophie de Russell, qui était justement une conception tellement révisionniste de l'analyse conceptuelle.

Keywords: metaphilosophy; conceptual engineering; conceptual analysis; term busting; *Principia Mathematica*; Bertrand Russell

1. Conceptual Engineering or Revisionary Conceptual Analysis?

Put a little too generally, in this article, I argue that conceptual engineering is not so different from conceptual analysis, at least if conceptual analysis is self-understood by its practitioner as a revisionary enterprise. More precisely, conceptual engineers have alleged that their metaphilosophy and approach differ from those of conceptual analysis. I argue that there is little-to-no detectable difference in their respective practices and methods, or in the practical impact of these, even if the two approaches differ in some metasemantic or attitudinal way.

What does it mean to say that there is little-to-no difference between conceptual engineering and conceptual analysis, and why would it matter if it is true? It depends on what kind of claim is being advanced. The claim might be meant as any one of the following:

1. a *historical* claim, meaning that it is claimed that many, most, or some significant selection of past philosophers can approximately or even equally be well understood as being conceptual engineers or as being conceptual analysts;
2. a *metaphilosophical* claim, meaning that the current methods, practices, and practical upshots of conceptual engineers and conceptual analysts do not differ much or at all;
3. a *sociological* claim, meaning that the individual persons who self-describe as conceptual engineers and those who self-describe as conceptual analysts are largely overlapping or even coincident groups of people, or that the persons belong to in-groups of researchers that largely overlap or even coincide independently of how they self-describe.

It is apparent that (3) is false, except on a trivial reading. The trivial reading of (3) is that the persons who are conceptual engineers and those who are conceptual analysts are mostly philosophers in the professional sense of that word: they make a living teaching and researching philosophy, and are usually housed in academic departments that house faculty who teach courses listed under the heading ‘philosophy,’ and so on. So-read, (3) is true.

Now on the interesting reading of (3), it is apparent that it is false. Although a large number of these persons are philosophers — not all of them are — the persons discussing conceptual engineering favourably and building the fast-growing literature around this metaphilosophy are not the same group of people as those persons discussing conceptual analysis favourably and passing over the conceptual engineering literature in a studious silence. There is some overlap, of course, but a cursory look at the citation networks with Google Scholar — the citation network around Herman Cappelen’s *Fixing Language*, say — shows that there is a central in-group discussing conceptual engineering, and those who praise conceptual analysis as a metaphilosophy are generally not in it. I am not here objecting to the existence of such in-groups; it is a sociological fact that likely applies to many sub-disciplines of philosophy, and the various branches of other disciplines, that in-groups of scholars will form around certain research topics and projects. That (3) is false on a non-trivial reading is unsurprising.

What I claim is that (1) and (2) are true. Although conceptual engineers usually make hay over the differences between conceptual engineering and conceptual analysis, it is not at all obvious what the difference is supposed to be, especially once we look past the slogans of each metaphilosophy and focus on their actual practices. This is consistent with the sociological fact that conceptual engineers are reacting to a certain comportment towards philosophy in their discipline, specifically to a dry and arid mode of conceptual analysis — barren as a desert landscape, which is not to say that nothing grows there — that they find unresponsive to social concerns. That may be, but this sociological fact does not show that conceptual engineering as a method is able to do things that some varieties of conceptual analysis cannot do. This casts a shadow on the night-and-day differences between conceptual engineering and conceptual analysis that some philosophers have enthusiastically drawn.

In §2, I review some of the explanations of what conceptual engineering is and how it is supposed to differ from conceptual analysis. The bulk of the article gives a concrete model of conceptual engineering or revisionary conceptual analysis — as I see it, two ways of describing what is practically the same activity — using Bertrand Russell's metaphilosophy, which is based on *Principia Mathematica*'s logic. Using Russell as an example will not come as a shock, since early analytic philosophers like Gottlob Frege, Friedrich Waismann, and Rudolf Carnap have already been invoked by conceptual engineers; for one among many examples, see (Cappelen 2018, §2.1.13). In the last section, §7, I discuss how Russell's practice of revisionary conceptual analysis can function as a logic-inspired *conceptual activism*, to borrow a phrase from Elizabeth Amber Cantalamessa, and what this shows about the by this point murky distinction between conceptual engineering and conceptual analysis, at least of the revisionary sort.

2. Explanations of Conceptual Engineering

Typically, the conceptual engineering metaphilosophy is described as conceptual amelioration or, in ten-cent words, critically considering what concepts we should have and use when describing the world. This slogan is a common way of self-describing, at least as a first-pass, among conceptual engineers (Cantalamessa, 2021, §2.1; Cappelen, 2018, pp. 5–6; Chalmers 2020, p. 4; Eklund, 2017, pp. 192–193; Isaac 2020, §2; Koch, 2021, §2; Scharp, 2013, pp. 4–7; Simion, 2018, p. 914; Simion & Kelp, 2020, p. 3).

But this slogan equally fits at least some kinds of conceptual analysis. As conceptual engineers sometimes put the difference, conceptual analysis investigates what concepts we do in fact have: it is descriptive rather than prescriptive. Conceptual analysts' methods may vary, and the mileage may, too, but conceptual analysts might be understood as studying concepts by analyzing them — breaking them apart — into their basic conceptual pieces (Moore, 1968), or by considering the uses of words that apply the concept (Austin, 1962; Ryle, 1949; Strawson, 1959), or by thought experiments asking about whether and how our actual concepts would apply, or how we would use words to apply a concept, in actual and counterfactual scenarios (Jackson, 1998; Kripke, 1980; Lewis, 1973; Putnam, 1975). It is surely a goal of, say, Saul Kripke's thought experiments in *Naming and Necessity* to show that the descriptivist concept or concepts of the nature and function of names held by philosophers (and so the concept we have on some interpretation of 'we') is wrong; that is, Kripke aimed to show that the descriptivist's conception of names is not the concept that we should have. But this fits the conceptual engineering slogan, whereas the right analysis of conceptual engineering, if it is really a distinct metaphilosophy, should show how it differs from conceptual analysis. So what is the right analysis of conceptual engineering?

We need to move past the slogans to get at the heart of what conceptual engineers are after. But some things that conceptual engineers have said do not really distinguish this metaphilosophy from conceptual analysis — as some of them concede. For instance, Matti Eklund suggests that the core of the conceptual amelioration slogan is that there are many available concepts with which to carve up the world and our experiences of it, and that conceptual engineers critically consider which ones we should use rather than just analyzing the ones that we have. Conceptual analysis in contrast takes some received or inherited concepts for granted and makes those the starting point of inquiry. In *Choosing Normative Concepts*, Eklund said:

> But distinguish between what we ought to focus on if our concern is *the relevant aspect of reality* and what we ought to focus on if our concern is *(human) thought about* the relevant aspect of reality. If our concern is the latter, of course there is a case for thinking about what our actual concepts are. Preference for philosophy as conceptual engineering relies on thinking of our concern as the former. …
>
> The guiding thought behind thinking of philosophy as conceptual engineering is that the concepts that we find ourselves with are only some among the possible concepts we could have and use. The concepts we have, we might have as a matter of historical accident. As I said above, in some measure they may have proven themselves by their usefulness. But that does not mean there are not more apt concepts for the theoretical and practical purposes that we have. It is crucial to be reminded of this, and perhaps especially so in the case of normative concepts, where our normative prejudices might have affected what concepts we have. (Eklund, 2017, pp. 194–195)

This puts meat on the bones, the bones being the brief conceptual engineering slogan that Eklund endorses in the same section. Eklund's motivation for adding these details is partly because he cautions against calling conceptual engineering "something importantly new" and suggests rather that conceptual amelioration, broadly understood, "has in fact been a traditional concern of philosophy" (Eklund, 2017, p. 194) and a program shared with past philosophers.

Eklund is right to urge caution, but unfortunately he proceeds to ignore it in the text. As he has essentially admitted, conceptual amelioration has long been part of philosophical practice, at least inasmuch as such philosophers offer rationales for rejecting what they take to be wrongheaded or deeply confused concepts. As Bimal Krishna Matilal recounts, the Jain philosopher Mahavira aimed to correct an overly narrow concept of self (*Atman*) that is presupposed in the question "Is the self eternal or non-eternal?" (Matilal, 1981, pp. 20–21) by answering "Both" — according to Jains, self is permanent because the self always exists, but it is non-eternal because it undergoes the cycle of deaths and rebirths as different kinds of being. This would imply that the received and problematically one-sided concept of self is confused, and accordingly should be rejected, perhaps for an alternative many-sided ('pluralistic') concept.

Similarly, the Jewish philosopher Maimonides in *The Guide for the Perplexed* argued that no positive conception of God is coherent, that any halfway true claim about God is a disguised or explicit negation like "God is not limited in power" (Maimonides, 2010, pp. 139–141), and that the most accurate way to describe God is to be silent. This implies that the extant conceptions of God are not descriptive and cannot be, and accordingly should be rejected.

So are Mahavira and Maimonides conceptual engineers or conceptual analysts? The core of the conceptual engineering as Eklund and some others have it — where the rubber meets the road — is that there are many available concepts with which to carve up the world and our experiences of it, and that conceptual engineers critically consider which ones we should use, rather than just analyze the concepts that we presently have when we begin to philosophize. But what stops the conceptual analyst from rejecting present concepts when the conceptual analyst finds these inherited concepts inadequate for some philosophical, scientific, or practical purposes? The answer is 'Nothing' because conceptual analysts can and do reject received concepts of the infinite, truth, names, and so on when they are found inadequate upon analysis.

Put another way, the practices of many philosophers like Mahavira and Maimonides is:

1. Argue that such-and-such concept is wrongheaded, incoherent, or faulty.
2. (Optional:) Propose an alternative concept (which may of course be new).

Anyone engaging in this practice is implicitly embracing the methodological claim that there are multiple possible concepts from which to choose, and that one or more of these need not be taken for granted. Indeed, arguably such proposed concepts can be entirely new (or close to it) or can be altered and revised ones somehow developed from, but differing significantly, from the extant ones from which one might have chosen before. But almost every philosopher engages in this sort of practice, including those self-describing as conceptual analysts and those self-describing as conceptual engineers. So how does Eklund's refinement of the slogan help us determine how the methodologies and practices of these two metaphilosophies are interestingly or substantially different?

Now conceptual analysts can, and some do, take some concept or concepts for granted. In *Counterfactuals*, David Lewis, with a platitudinous air, wrote:

> One comes to philosophy already endowed with a stock of opinions. It is not the business of philosophy either to undermine or to justify these preexisting opinions, to any great extent, but only to try to discover ways of expanding them into an orderly system. … It succeeds to the extent that (1) it is systematic, and (2) it respects those of our pre-philosophical opinions to which we are firmly attached. (Lewis, 1973, p. 88)

Even in Lewis' brief methodological remarks here, there is plenty of metaphilosophy to unpack. Focusing on just two issues, we can ask, first, what is the relevant stock of opinions, e.g., is it our technical or scientific theories, beliefs, and concepts, or is it our ordinary theories, beliefs, and concepts — or both? Second, what does constraint (2) come to? One issue concerns what "firmly attached" means. Is it the case that I can reject my firm belief in the truth of '1≠2' if I am only casually attached? Or is this subject to what my conversation partner or partners are firmly attached to? Another issue is what "respect" means, e.g. can we respectfully reject those beliefs that we hold with strong conviction if they contradict our best available scientific theories?

On one reading of Lewis' remarks, one might come away from this passage with the idea — call it 'Lewisian,' if you will, since whether Lewis accepted this idea is beside the point here — that proper method in philosophy is to critically examine and make systematic our ordinary theories, beliefs, and concepts, and to preserve to the greatest extent possible what we can while being systematic, the beliefs we held with a great amount of conviction when we undertook a given philosophical investigation. As a toy example, if one believed with a great amount of conviction that there is an all-powerful, all-good, and all-knowing god who created the universe out of nothing, then good philosophical methodology would not require that one reject this belief unless it proved impossible to systematize with other beliefs to which one was firmly attached. One can, of course, see some issues here with a method that allows us, in principle, to be led in our philosophical activity by beliefs, ordinary or scientific, held firmly and perhaps widely at one time or another, that most of us reject and think wildly implausible. Examples are, e.g., the belief that phrenology justifies racist social arrangements, and the belief that medical maladies are caused by sinful behaviour, whether by the afflicted or their genealogical ancestors.

This is not to say that *Lewis* believed, or that Lewisians should believe, that such incredible ideas should be given even the slightest deference by philosophers. But, as a point of method, one can see how epistemically conservative readings of Lewis' remarks could justify as good philosophical method bad attempts to justify one's preconceived notions of how humans, or the world at large, are. That is, radically revising the perhaps faulty concepts with which we began is not explicitly countenanced or stressed in the reading of Lewis' remarks given above.

On this reading of Lewis' remark about philosophical methodology, that philosophers should be epistemically conservative with respect to our firmly held beliefs so long as these beliefs can be systematized, it is easy to see how conceptual engineers would find severe faults in the philosophical methodology espoused by Lewisians. After all, if the background concepts on which such beliefs are based are faulty, confused, or perpetuate ongoing injustices, why should revising them be in any way discouraged by methodological constraints? Against this Lewisian idea, it might be thought that proper philosophical method is revisionary, and seeks perhaps continual improvement in our flawed conceptual apparatus, so that discarding even our firmly held beliefs is not as problematic as the Lewisian dictum, as glossed above, might suggest. Consequently, it is easy to see why the sociological claim (3) is false. Surely, conceptual engineers are reacting against such Lewisian methodological constraints about how philosophy should be done, and rejecting that epistemic conservativism towards beliefs to which we are firmly attached is part of proper philosophical method. As I see it, conceptual engineers do read Lewisian dicta in the sort of way glossed above, and so it is unsurprising that they reject these constraints explicitly, as, for example, Kevin Scharp (2020, p. 400) does. Frankly, Scharp and others are right to revolt against such Lewisian dicta (whether or not Lewis himself held them).

But Lewis never spoke for all conceptual analysts, even if he spoke for many of them. His casual remark suggesting a conservativeness in proper philosophical method is not accepted by every conceptual analyst past or present — Russell is a counterexample for the past, and I am one for the present. The "Canberra Plan," as Jennifer Nado (2021, Note 4) has called it, is one species of conceptual analysis and should not be confused with the metaphilosophical genus — this would be like confusing a dalmatian with dogs in general — nor are conceptual analysts limited to the conservative methodology adopted in the "Canberra Plan."

So the divide between conceptual engineers and conceptual analysts cannot be that the latter but not the former take some concept or concepts as their largely unquestioned starting point. This is equally a problem for the approach of Manuel Gustavo Isaac who suggests that conceptual engineers ask "What does the concept *C* do?" and "What concepts should we have?" while conceptual analysts ask "What is the concept *C*?" and "What concepts do we have?" (Isaac, 2020, §2), This is a slightly different form of the slogan, but it runs into the same problems that we already saw: conceptual analysts can engage in ameliorative work, too, and are not stuck with the concepts that we have unless they choose to be.

Likewise, suggesting that conceptual analysis is descriptive and conceptual engineering is prescriptive, as Cappelen (2018, §1.2, §3.4) and Derek Ball (2020, p. 35) do, is to ignore the diversity of views among conceptual analysts. As Mark Richard says, "Conceptual analysis is generally not just descriptive but normative" (Richard, 2020, p. 377). Richard has in mind the fact that a conceptual analyst often finds many vague and confused concepts bound up with some word or words, or with their use, and must evaluate which concepts, whether one already available, perhaps with revisions, or one that is nearly or entirely new, is most apt or practical in specific contexts for one's purpose or purposes. An important upshot of Richard's claim that conceptual analysis itself is a normative and not merely descriptive practice is that conceptual analysts have proposed alterations and revisions to concepts, and even altogether new ones, as a result of their investigation of, say, necessary and sufficient conditions for the exemplification of a concept or 'What is *X*?' style questions. This is not to say that they all do this, of course: like myself, Richard is here talking about the genus, not the species: some conceptual analysts do not engage in that evaluative activity, but they may. In fact, they have done so, as will be borne out by our consideration of some examples of conceptual analyst practice below.

Where does this leave us? We saw that some careful refinements of the conceptual engineering slogan are insufficient to distinguish it from conceptual analysis. Philosophers of either metaphilosophical stripe can engage in ameliorative evaluation of concepts, reject received concepts, and so on. So how should we distinguish the two metaphilosophies?

My view is that we should not bother trying. There is no substantial difference and no practical difference between what a conceptual analyst can do and what a conceptual engineer can do. There are some conceptual analysts who do different and decidedly non-evaluative work, and there are some conceptual engineers who do different and decidedly non-descriptive work. Most of us do not sit on just one side of this divide, and there is no reason to build a fence between them: we can plant a foot on either side as occasioned by our need.

The strategy of this article is to ignore the slogans and the fence-raising. I will instead offer an example of Russell, a highly influential philosopher from the Anglo-American tradition. The interesting thing about Russell is that his metaphilosophy and practice could be equally described as conceptual engineering — at least so far as conceptual engineers' self-descriptions go — or as conceptual analysis. Regarding what we might think of as the genus of conceptual analysts, those "Canberra Plan" cases where the contrast with conceptual engineers is actually present are very rare and atypical. Such conceptual analysts are rather like the platypus species is to the genus mammal: that there is a species of conceptual analyst whose methodology, practice, and metaphilosophy actually does differ from that of modern conceptual engineers does not upset the main point that there is not much difference between conceptual engineers and conceptual analysts in their methodology, practice, and metaphilosophy. Indeed, the upshot of considering Russell's example is that, so far as I can tell from the slogans for conceptual engineering, whatever most conceptual engineers can do, most conceptual analysts can do, and vice versa. This places a burden of proof on those conceptual engineers who wish to call their philosophy something new rather than something borrowed and renamed.

3. A Russellian Take on Conceptual Engineering?

Russell is well known as a logicist, one who holds that all mathematics is part of logic, and for attempting to demonstrate this philosophical position beyond all reasonable doubt in the co-authored *Principia Mathematica*. But Russell said that logic was the essence of philosophy, not merely the essence of mathematics. This Russellian metaphilosophy is put into practice in *Principia*, where logic is used as a tool to revise our mathematical concepts. The Russellian, logic-centric view of philosophy has lessons for the modern debate over how we should understand conceptual engineering. In particular, *Principia*'s characteristic practice of *term busting* shows precisely how operating on linguistic expressions can revise our mental concepts. The upshot of this inquiry is that *Principia* provides just such a concrete account of conceptual engineering that conceptual engineers have recently sought.

On the heels of publishing the three co-authored volumes of *Principia Mathematica*, Russell told audiences at both Harvard and Oxford that logic was the essence of philosophy:

> … every philosophical problem, when it is subjected to the necessary analysis and purification, is found either to be not really philosophical at all, or else to be, in the sense in which we are using the word, logical. But as the word "logic" is never used in the same sense by two different philosophers, some explanation of what I mean is indispensable at the outset. (Russell, 1914, p. 33)
>
> Philosophy, if what has been said is correct, becomes indistinguishable from logic as that word has now come to be used. (Russell, 1986a, p. 65)

It is not apparent from such slogans how this Russellian metaphilosophy is at all relevant to modern discussions in metaphilosophy. When we dig just a little deeper, we might be surprised that Russell's advocacy of logic as the essence of philosophy is animated by concerns similar to those now animating metaphilosophical discourse over conceptual engineering:[1]

> Philosophy, from the earliest times, has made greater claims, and achieved fewer results, than any other branch of learning. Ever since Thales said that all is water, philosophers have been ready with glib assertions about the sum-total of things; and equally glib denials have come from other philosophers ever since Thales was contradicted by Anaximander. (Russell, 1914, p. 3)

If one just replaces 'philosophy' and 'philosophers' with 'conceptual analysis' and 'conceptual analysts,' the result might have been quoted from a modern metaphilosopher arguing for conceptual engineering as a replacement for conceptual analysis.

Recent discussions in metaphilosophy have drawn on the history of analytic philosophy: metaphilosophical morals and models for conceptual engineering have been especially drawn from Carnap's notion of *explication*, and to a lesser extent from Nelson Goodman's notion of

[1] Compare Russell's criticisms with those of a "Standard Model" of philosophical methodology in (Nado, 2021, §1), for instance.

reflective equilibirum, from Peter Strawson's critique of Carnapian explication, and from Waismann's notion of *open texture* (Brun, 2016; Brun, 2020; Carus, 2012; Dutilh Novaes, 2020; French, 2015; Nado, 2021; Pinder, 2020; Prinzing, 2018; Richardson, 2013; Tanswell, 2018). Despite Russell and modern conceptual engineers sharing some metaphilosophical concerns, most work connecting conceptual engineering to past analytic philosophers has neglected to draw morals for modern metaphilosophy from Russell's work. This is surprising since Russell's logical works, especially *Principia*, were major influences on Carnap's philosophy.

There is thus a Russell-sized gap in the literature on conceptual engineering. That someone should try to fill it hopefully is not a shock. All the more so because influential analytic philosophers have enjoyed a starring role in the conceptual engineering literature. Moreover, the theme explored here — that there is as much daylight between most conceptual engineers and most conceptual analysts in methodology and practice as there is between polar nights — has been discussed before. Catarina Dutilh Novaes (2020, §3.1) has systematically compared Carnapian explication and Sally Haslanger's ameliorative analysis, and has found that some instances of Carnapian explication are descriptive and not ameliorative — much as conceptual analysis is alleged to be by conceptual engineers who are inspired by Carnapian explication. Here I go in a somewhat different direction, with a different philosopher as the starting point, to argue that, in some notable cases, conceptual analysis, if it is self-understood in a revisionary way, can achieve much of the conceptual engineering that conceptual engineers want to do.

In §4, I explain *Principia*'s characteristic practice of term busting. In §5, these pieces are put together to give a general account of just how logical tools operate on linguistic activities to conceptually engineer. This account is illustrated with a mathematical example from *Principia*, one that was influential in the history of analytic philosophy. In §6, I discuss more generally what it takes for term busting to be successful conceptual engineering. In §7, I conclude by indicating how *Principia*'s logic facilitates conceptual activism such as appeals to concept engineers, and, further, that this is precisely why Russell's metaphilosophy made logic the essence of philosophy. Setting aside the question of whether conceptual engineers should do this too, I think this example shows that, in some notable cases, philosophers can, by asking 'What is *C*?' questions and self-describing as undertaking a descriptive enterprise, do exactly the kind of conceptual revision that appeals to conceptual engineers.

4. Term Busting Explained

Just how does one conceptually engineer? The Russellian answer is that one does this with logic: specifically, conceptual engineering is done through *term busting*. Russell's theory of descriptions is the most familiar example of term busting: there are many other such examples of it in texts like *Principia Mathematica* and *Our Knowledge of the External World* — see (Elkind, forthcoming). Term busting is the process of taking apparent terms and defining them away, that is, busting them into incomplete symbols, that is, into non-term parts of formulas. A *term* in the logical sense is a simple, truth-inapt piece of language. Here I use the word 'term' to include expressions, that is, exercises, of either referential or predicate concepts so long as they are simple ones whose exercise does not involve any constituent concepts. In contrast, a *formula* in the logical sense is a complex (non-term) piece of language that is truth-apt. In formal settings, terms are specified precisely and formulas are characterized by recursive rules.

An *incomplete symbol* is a complex piece of language that is truth-inapt. Incomplete symbols lack standalone meaning; rather, they are only used meaningfully as proper parts of a formula.[2] Yet they are complex symbols, and the formulas in which they are used have meaning. Definite descriptions are a well-known example of incomplete symbols:[3]

> We will take "The author of *Waverley*". That is a definite description, and it is easy to see that it is not a name. A name is a simple symbol (i.e. a symbol which does not have any parts that are symbols), a simple symbol used to designate a certain particular or by extension an object which is not a particular but is treated for the moment as if it were, or is falsely believed to be a particular, such as a person. This sort of phrase, "The author of *Waverley*", is not a name because it is a complex symbol. It contains parts which *are* symbols. (Russell, 1986b, pp. 213–214)

An incomplete symbol is then a non-term part of a formula whose uses in a formula are defined. So, strictly speaking, an incomplete symbol is itself never defined, for incomplete symbols have no standalone meaning. Instead, formulas in which the incomplete symbol is used are defined. For example, on the Russellian account we translate 'the king of France is bald' as $\exists x(\forall y(Fy \leftrightarrow x{=}y) \wedge Bx)$ so that the noun phrase 'the king of France' is no longer a term but an incomplete symbol. In this example, the symbols '$\exists x(\forall y(Fy \leftrightarrow x{=}y) \wedge \ldots$' replace the string 'the king of France,' which may have been wrongly symbolized by a simple term occurring in subject position. This more complex string of symbols is an *incomplete* symbol because it is not a standalone well-formed formula: the string has a conjunction-sign without the right conjunct (better: a left scope marker without the right one), so that read aloud it would be 'there exists an *x* such that any *y* that is a King of France is identical with *x* and …' This is ill-formed because we do not know what else is being said about the *x* that is the king of France — hence the incompleteness of the symbol.

In the above case, it would be deeply misleading to say that we had defined the noun phrase expressing a referential concept 'the king of France': rather, the translation eliminates formulas in which the apparent term 'the king of France' occurred using formulas in which incomplete symbols are used.[4] The former but not the latter procedure treats '$(\iota x)(\varphi x)$' as a term, and so the latter approach is logically mistaken on the Russellian view: we can and must

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[2] "By an 'incomplete' symbol we mean a symbol which is not supposed to have any meaning in isolation, but is only defined in certain contexts. In ordinary mathematics, for example, d/dx and $\int_a^b$ are incomplete symbols: something has to be supplied before we have anything significant. Such symbols have what may be called a 'definition in use.' … This distinguishes such symbols from what (in a generalized sense) we may call *proper names*: 'Socrates,' for example, stands for a certain man, and therefore has a meaning by itself, without the need of any context. … Whenever the grammatical subject of a proposition can be supposed not to exist without rendering the proposition meaningless, it is plain that the grammatical subject is not a proper name. Thus in all such cases, the proposition must be capable of being so analysed that what was the grammatical subject shall have disappeared" (Whitehead & Russell, 1957a, p. 66).

[3] Crucially, and in stark contrast to Russell and Russellians, some logicians treat descriptions as terms such as could be substituted into an identity expression. See, for example, (Lambert, 1992, p. 155).

[4] "It follows from the above that we must not attempt to define '$(\iota x)(\varphi x)$,' but must define the *uses* of this symbol, i.e. the propositions in whose symbolic expression it occurs" (Whitehead & Russell, 1957a, p. 67).

get by without ever assigning a meaning to '$(\iota x)(\varphi x)$' because the *definiens* formulas using but not defining incomplete symbols are still meaningful.

The Russellian thus defines formulas in which incomplete symbols occur without ever defining incomplete symbols by themselves. Terms and formulas will be meaningful, but incomplete symbols will not, even though formulas in which they occur are meaningful. The row-to-column table below summarizes the Russellian taxonomy of symbols:

	Simple/Complex	**Meaningful**	**Truth**
Terms	Simple	Standalone	Inapt
Formulas	Complex	Standalone	Apt
Incomplete Symbols	Complex	Only in use	Inapt

We can finally explain *term busting*: it is the process of defining a formula φ in which an apparent term a occurs using another formula ψ in which a no longer occurs. This is precisely what is done when the assertion 'the king of France is bald' is defined as above: we define away the formula 'Ba' in favour of $\exists x(\forall y(Fy \leftrightarrow x{=}y) \land Bx)$. Notice that '$a$' has disappeared from the latter expression and that there is no term corresponding to just 'a' in the new expression. So if the *definiens* is agreed to be meaningful, then we do not need to define 'a' at all, but only formulas in which 'a' occurs. As a consequence, the term 'a' is a pseudo-term in the sense that it is a dispensable piece of language: it can be eliminated entirely using formulas ψ that do not contain it. The use of 'a' is solely a matter of convenient abbreviation, and so 'a' is just an apparent term. This process can be called 'term busting' for short because the result is to 'bust' the apparently simple term 'a' apart into a complex incomplete symbol. More precisely, we bust formulas containing the apparent term 'a' by defining them using formulas that do not contain 'a.'

So in term busting, one offers an eliminative definition or definitions of formulas containing a problematic apparent term like 'a.' But merely offering such a definition is insufficient for successful term busting. How does one really know that 'a' is eliminable — that everything we had asserted using formulas φ that contain 'a' can be said using formulas ψ not containing 'a'? From inspection of a proposed definition alone, it is not obvious when such an elimination has been achieved, let alone how to reconstruct correct chains of inference between formulas containing 'a' using only formulas that do not.[5] Offering an eliminative definition alone is insufficient both for success in term busting and for justifying that one's term busting is successful. This raises two questions: (1) What makes for successful term busting? (2) How does one justify that a proposed eliminative definition is a term busting success?

The answer to (1) is that one must also show how the eliminative definition proposed preserves the desired data. *Data* are claims that seem manifestly true even if the exact conditions of the data's truth are opaque or confusing. As Russell puts these two points:

[5] Thus the discussions of Quine's proposed elimination of singular terms from his regimented language.

> You always have to start any kind of argument from something which appears to you to be true; if it appears to you to be true, there is no more to be done. You cannot go outside yourself and consider abstractly whether the things that appear to you to be true are true; you may do this in a particular case, where one of your beliefs is changed in consequence of others among your beliefs. (Russell, 1986b, p. 161)

> It will generally be found that all our initial data, all the facts that we seem to know to begin with, suffer from vagueness, confusion, and complexity. … What is wanted, as a rule, is some new effort of logical imagination some glimpse of a possibility never conceived before, and then the direct perception that this possibility is realised in the case in question. Failure to think of the right possibility leaves insoluble difficulties, balanced arguments pro and con, utter bewilderment and despair. But the right possibility, as a rule, when once conceived, justifies itself swiftly by its astonishing power of absorbing apparently conflicting facts. (Russell, 1914, pp. 241–242)

On the Russellian view, the starting point of philosophical inquiry is a body of statements that seem true, and so are data. But note that this Russellian philosophical methodology is not the same as the Lewisian one sketched above. First, Russell's motivation for it is that we cannot escape starting with what we take to be true: in short, there is no other starting point to take than what we believe to be true (Russell, 1986b, p. 161). Second, Russellian methodology requires replacing these starting-point beliefs, which are "always rather vague and ambiguous," with "what you cannot doubt because of its clearness and distinctness," and says that, by this analytic method, we "pass from the vague to the precise" (Russell, 1986b, pp. 161–163). Note that Russell does not think that this assures certainty about the results of analysis, that is, it is always possible that the results of analysis are mistaken (Russell, 1986b, p. 163). The point is that the Russellian method assumes, if not practically requires, replacing our initial beliefs, however strongly we had held them. The Lewisian philosophical methodology described above does not require such replacements where we can achieve systematicity without discarding strongly held beliefs, and arguably discourages replacing them.

So, on the Russellian view, we need to grasp more precisely the conditions of the data's truth, that is, the truth-conditions of beliefs that we take to be data. Clarifying conditions under which our beliefs are true, that is, clarifying the actual commitments and consequences of such beliefs, is one purpose of eliminating apparent terms: one obviates the conceptual confusions involved in applying the confused concepts associated with these apparent terms by recovering the data without ever using the terms, thus showing that the confused concepts associated with the apparent terms are eliminable. The Russellian idea here is that, if we eliminate apparent terms whose use in expressing true data involves problematic concepts, and find some other way of expressing that data without using the apparent terms associated with these problematic concepts, then we will hopefully find a way of re-expressing the true data with more exact and precise words, and using terms whose associated concepts are less confused. This forms a kind of dispensability argument against the problematic concepts: if we can recover (re-express) the data without relying on the problematic terms at all, and instead rely on terms associated with entirely different but less vague notions, then we will have the freedom to eliminate the confused concepts that were at the start involved in our initial data.

Successful term busting is constrained, though, in the following way: term busting has to be done in such a way that it preserves the truth of some data, appropriately reconstrued, with eliminative definitions. For example, it should not come out that ‘1≠2’ is false, even if what is involved in the truth of this claim turns out not to be numbers, but some other features of the (abstract or concrete) world entirely. The Russellian (really, Cantorian) view is that true data like ‘1≠2,’ in fact, involves not numbers as abstract, particular entities, but relations of one-one correspondence. The upshot of reconstruing ‘1≠2’ on this basis is to give a new and clearer view of their truth-conditions, but without abandoning their truth. In this way, some data that had been expressed in formulas with a problematic apparent term now have a more exact expression in formulas using one or more incomplete symbols, but the data is recovered because the Russellian term buster’s analogue of ‘1≠2’ still comes out true.

So term busting, to be successful, requires that the vague but true data with which one began are recovered in some suitable form. This raises some hard questions about what counts as recovering the data, and to what extent radically abandoning some of the data with which we began might still count as successful term busting. For example, reconstruing ‘1≠2’ as a Russellian term buster does, using the notion of one-one correspondence, shows (if it is successful) that we do not need numbers as (abstract or concrete) entities to salvage the theorems of arithmetic. So taking the theorems of arithmetic as part of our vague but true data, it may be that certain associated claims like ‘2 is an entity’ may come out false. But if one held onto the existence of 2 as a datum, then it would be the case that some data are discarded and come out false after term busting on the Russellian approach.[6] So recovering the data is not an all-or-nothing affair, and, in fact, it can be a delicate balancing act. But then what counts as a successful recovery of the data when one practices Russellian term busting?

I will say more about what it means to successfully recover the data on the Russellian approach below. But the relevant point here is that Russellian methodology practically requires revising our conceptual apparatus in a way that the Lewisian methodology does not: Russellian methodology requires eliminating confused and vague data and replacing it with clearer claims whose truth-conditions are much more well understood and involves more precise concepts. So, successful term busting practically requires conceptual revision, sometimes of a radical sort.

So, I will return to the question of what successful recovery of the data amounts to. But how does one show that the data have been recovered, assuming this has been done? This brings us to question (2) above. The answer to (2) is that success in term busting is shown through synthesis, that is, by a positive, constructive program of proving that the data are recovered and preserved in their truth-value, at least overall and in the main, in a way that is consistent with the proposed eliminative definitions. One justifies that one’s term busting succeeded by proving that the data are recoverable on their eliminative definitions. And one proves that the data are recoverable by actually recovering them, say, by deductively proving that they are recoverable. Russell helpfully describes this synthetic logical process:

> We start from a body of common knowledge, which constitutes our data. On examination, the data are found to be complex, rather vague, and largely

[6] Compare the Russellian approach to the Lewisian one, which refuses to subvert the beliefs of practitioners in well-established branches of mathematics even where ontological commitments are at play (Lewis, 1991, §2.8).

> interdependent logically. By analysis we reduce them to propositions which are as nearly as possible simple and precise, and we arrange them in deductive chains, in which a certain number of initial propositions are *premisses* for the body of knowledge in question. Premisses are thus quite different from data — they are simpler, more precise, and less infected with logical redundancy. If the work of analysis has been performed completely, they will be wholly free from logical redundancy, wholly precise, and as simple as is logically compatible with their leading to the given body of knowledge. (Russell, 1914, p. 211)

In short, one justifies that one's term busting is successful as *Principia* did: by proving it.

Term busting thus comes with not one but two corresponding obligations: the Russellian conceptual engineer must both recover the vague but true initial data and prove that it can be recovered under their eliminative term busting definitions. This is why *Principia* is so long. Indeed, the eliminative definitions of that work occupy only a couple of hundred pages over three volumes. If term busting were just offering eliminative definitions as on the theory of definite descriptions, then Alfred North Whitehead and Russell did not need to spend 10 years writing *Principia*. Why then is *Principia* three volumes and 1,992 pages, mostly of proofs and theorems? Why does *Principia* have any proofs at all?

The specific answer is that the proofs are needed to justify logicism. But the far more interesting answer for conceptual engineers is the general answer: the proofs show how central mathematical concepts like *number*, *class*, and *series* admit of logical definitions without loss of the (suitably reconceived) data. In taking *Principia*'s logic as the paradigm of philosophical method and applying to a whole host of additional philosophical topics — as Russell did — *Principia* can be taken as a shining example of revisionary conceptual analysis (or conceptual engineering) on which the old mathematical concepts are abandoned (really abandonable, because the terms with which these concepts are associated are no longer invoked, and so there is no need for them) in favour of new ones (those associated with genuine terms) upon which the data is then proven to be recoverable in a suitably reconceived form. Now there are lingering concerns here, alluded to above, about how the data, if it can change, can be successfully recovered. In term busting, some data may be substantially revised: but there must be some constraints on this procedure, or else we can pick and choose what data we recover.[7] I discuss this important methodological point about the Russellian approach in §6.

So showing that one's term busting is successful involves something like a translation-and-demonstration program wherein the *definiens* is shown, first, to be able to express

[7] It may be objected that conceptual engineers are far less conservative than a Russellian term busting philosopher because they dispense with the requirement that the data must be recovered. The worry here may be that the Russellian approach does not, or cannot, go far enough. This seems doubtful, since Russell proposed conceptual revisions were (and perhaps still are) quite radical in technical areas of philosophy and mathematics as well as in our social and political arrangements, and arguably were as radical as what many modern conceptual engineers have proposed. More to the point, an interesting upshot of the Russellian example considered here is that requiring some recovery of the true but vague initial data is consistent with quite radical conceptual revision, that is, inquiring as (revisionary) conceptual analysts do can result in just the sort of conceptual amelioration that conceptual engineers seek. This suggests the two metaphilosophical approaches, at least in some instantiations of each, are not worlds apart.

everything that we had previously been saying using the *definiendum* and, second, to preserve correct inferential chains between formulas. In this way, we can be assured that ψ can be used to express and correctly reason in any contexts in which we had previously used φ.

This explains term busting. Next I use term busting as a model of conceptual engineering.

5. Conceptual Engineering Through Term Busting

I will begin by discussing an example from *Principia* of term busting as conceptual engineering that had a significant influence on early analytic philosophy: number terms.[8] This discussion will suggest some general morals for conceptual engineering as term busting. For purposes of this section — but see §6 — I will set aside the controversy over whether *Principia*'s recovery of arithmetic succeeded, since this is beside the point of having a model of conceptual analysis that can secure revision to our concepts such as conceptual engineers are after.

Consider the English predicate 'is a number' and apparent number terms like '8' and '16.' Such terms occur in theorems of arithmetic, as in '8+8=16,' as do claims like '8 is a number' and '16 is a number.' These claims are in some sense true. But their truth seems to involve genuine terms whose apparent referents are numbers. Just what are numbers? How do we know them? How many of them are there? Can they be infinitely large? For centuries, the mathematics of infinity went underdeveloped, partly because it was widely thought that numbers could only be finitely big: it was believed that infinite numbers were self-contradictory, so that no actual infinite numbers could exist (Russell, 1993, pp. 372–374). Still, it was held that Euclid proved that there was no finite limit on finite series of cardinal numbers like the positive whole numbers, so the workaround was that finite numbers were said to make up a potentially but not actually infinite series.

The work of nineteenth-century mathematicians like Georg Cantor upended all of that. Cantor's work showed that what had appeared to be necessary truths about all numbers were, in fact, features of finite numbers, upsetting our old habits of mind:

> Some purely arithmetical peculiarities of infinite numbers have also caused perplexity. For instance, an infinite number is not increased by adding one to it, or by doubling it. Such peculiarities have seemed to many to contradict logic, but in fact they only contradict confirmed mental habits. The whole difficulty of the subject lies in the necessity of thinking in an unfamiliar way, and in realising that many properties which we have thought inherent in number are in fact peculiar to finite numbers. (Russell, 1914, p. 182)

The new, Cantorian definition of numbers as one-one correspondences induced a tectonic shift in our thinking about numerical concepts. The key to this conceptual revolution was the busting

[8] Similar morals could be drawn from other examples from *Principia* of term busting as conceptual engineering, like class terms, descriptive terms, and the term '=' for identity. In a slightly different vein, Tanswell (2018, §6) has discussed the applicability and interest of conceptual engineering in mathematics, particularly to debates over the universe or multiverse of sets, though there is no direct connection to Russell or conceptual analysis drawn in that article, which focuses on Waismann.

of apparent number terms. The Cantorian account of the predicate ‘is a number’ treats number terms as incomplete symbols, eliminating such terms using the complex notion of cardinal similarity, that is, of one-to-one correlations.[9] Number terms are defined as classes of similar classes where ‘being similar to a given class’ is a matter of the existence of a one-to-one correlation to the given class.[10]

This significantly revises formulas involving apparent number terms. Confining ourselves to classes of individuals for a moment, instead of using, say, ‘1’ and ‘2’ as number terms, one uses ‘the class of all unit classes’ or ‘the class of all classes of couples.’ More formally (Whitehead & Russell, 1957a, *52.01, *54.02):

$$1 =\text{df } (\iota\beta)(\forall\alpha)(\alpha \epsilon \beta \supset (\exists x)(\alpha = \{x\})).$$

$$2 =\text{df } (\iota\beta)(\forall\alpha)(\alpha \epsilon \beta \supset (\exists x)(\exists y)(\alpha = \{x, y\} \wedge x \neq y)).$$

Then the linguistic judgement ‘1≠2’ is accordingly redefined as ‘the class of unit classes is not identical to the class of unordered couples,’ which has the form

$$\vdash (\iota\beta)(\forall\alpha)(\alpha \epsilon \beta \supset (\exists x)(\alpha = \{x\})) \neq (\iota\beta)(\forall\alpha)(\alpha \epsilon \beta \supset (\exists x)(\exists y)(\alpha = \{x, y\} \wedge x \neq y)).$$

Principia proves that ‘1≠2’ in this sense at *101.34, and the crucial theorem used in the proof is ‘there is a unit class in the class of all classes of unit classes that is not an element of the class of all classes of couples,’ which has the form

$$\vdash \iota`y \epsilon 1 \wedge \iota`y \not\in 2.$$

In other words, there is a unit class $\iota`y$ with the property *being in 1* (= *the class of all unit classes*) and also the property *not being in 2* (= *the class of all classes of couples*).

In general, for arbitrary numbers *n* and *m*, this sort of statement in turn relies on the key notion of a one-one correlating relation. To say that a class α is an element of *m* but not of a distinct *n* is to say that there is no one-one relation *R* correlating α with any β having the property *being in n*. So the formula ‘α has cardinality 1’ is defined as ‘there exists a one-to-one correlation between α and a singleton class,’ and the number 1 is defined as the class of all such classes β. Similarly for a class of cardinality 2 and the number 2, and so on for other numbers. In *Principia*’s framework, there are further pseudo-terms amenable to term busting lurking even in this restatement — in particular, class terms are also term busted in *Principia* — but we can ignore them here. The crucial point is that the apparently simple number terms like ‘1,’ ‘2,’ ‘*n*,’ and ‘*m*’ are replaced by complex incomplete symbols. For example, the apparent number term ‘1’ disappears entirely from the defining formula: ‘α has cardinality 1’ is what we called ‘*φ*’

[9] Even in modern set theory texts, cardinality is defined in terms of one-one correspondences. For example: “We use 1–1 functions to compare the sizes of sets” (Kunen, 1980, p. 27).
[10] This account of numbers is separable from an ontology of classes: for example, *Principia* adopts this account of numbers but eschews an ontology of classes — see (Whitehead & Russell, 1957a, *20; 1957b, §A).

above and ‘there exists a one-to-one correlation between α and a singleton class’ is ψ, while ‘1’ is the apparent term ‘*a*.’

The elimination of (apparently referential) number terms in *Principia* is a clear case of term busting. How is this also conceptual engineering? Asserting that 1≠2 on the received view amounts to denying an identity between two actual numbers, or to the extension of some particular numerical concepts of 1 and 2. On the Russellian busting of number terms, number terms are eliminated entirely, so there are no numbers to pick out at all. On *Principia*’s revisionary term-busting approach, apparently referential number terms, whether one takes them to pick out abstract particular numbers or concrete particular concepts, are never deployed in thinking about numbers. This is because all number terms disappear from arithmetic theorems, and from their associated judgements or assertions, so that no numbers as particulars, whether abstract or concrete, are ever needed in doing arithmetic. Theorems like ⊢1≠2 take a form like the above, which is free of number terms. Since there are no number terms in *Principia*’s recasting of ‘1≠2,’ the received concept of numbers as particular things, whether abstract or concrete, is abandoned entirely in mathematics.

Do we still have a concept of number after all this term busting? The answer to that question depends on what we mean by ‘a concept of number.’ We have a general concept of number as one-to-one correspondences. And we have concepts of specific numbers, like 1 which is reconceived as *the class of all classes standing in a one-to-one correspondence with any unit class*. But we do not have a concept of number as a particular (abstract or concrete) entity. Numbers as *entities* are not presupposed for the truth, or as part of the truth-conditions, of any theorems of arithmetic. This is despite the view, perhaps common when we are learning arithmetic at a younger age, that what arithmetic is about is numbers (as entities), and what makes the theorems of arithmetic true is that they correctly describe features of numbers (as entities). We are free to embrace this conception for various better or worse philosophical reasons. However, the term busting and proofs given in *Principia* show that, so far as the needs of mathematics go, even mathematicians do not need numbers (as entities). So we still have a concept of numbers (as classes of classes standing in one-to-one correspondences) but we do not need, for mathematics, a concept of numbers (as entities). So term busting eliminates the old concepts through a dispensability argument, which is why recovery of the data with the revised concepts is crucial to the success of term busting.

Does this conceptual revision effected by term busting — abandoning any use of the received concept of numbers as particular things by eliminating number terms entirely — make any noticeable difference? Absolutely. One significant upshot of busting number terms using one-to-one correlations is that the mathematics of infinity became clear. The behaviour of infinities that violates the usual rules for finite numbers — some being bigger than others, or the same size as their proper parts — all became explicable. Cantor’s innovations helped induce the mathematical study of infinite cardinals and ordinals (Grattan-Guinness, 2000, §3.7). In short, the fruitfulness and conceptual revision effected by term busting is shown by its substantial role in the creation of a whole new field of mathematics.

Further, the conceptual revision worked by this linguistic change brought into relief new philosophical and mathematical concerns, particularly about the existence of numbers. In formulas of arithmetic containing number terms, and so involving the actualization of referential numerical concepts, there is an appearance of such claims being about numbers.

This raises a philosophical question about what numbers are. Here we are faced with an array of difficult alternatives. If numbers are abstract entities, there are additional questions to be answered as to how we know such entities. If numbers are concrete entities, then the apparent necessity of mathematical truths seems lost. If numbers are not concrete entities, then it is difficult to grasp how arithmetic claims could be true (as they seem to be).

If on the contrary no reference to numbers is involved in formulating and proving arithmetical theorems, and no number terms are involved in their assertion, then apparent reference to numbers vanishes. Arithmetic is not about numbers at all. Even if there are further questions about the subject-matter of these new formulas that are free of number terms, the conceptual change effected by term busting is significant.[11]

6. Counting Successes in Conceptual Engineering

In §5, I offered numerical concepts as an example of conceptual engineering as term busting in *Principia*. This model shows precisely how conceptual engineering is effected by concrete changes to formulas: term busting alters the linguistic acts of predication in thought, speech, and writing by which concepts are actualized, enabling the abandonment of received concepts for scientific or technical ones, none of which need to correspond to the original unscientific ones. In the above example, number terms were eliminated entirely, and so their associated received concepts are never invoked — different, non-number ones of classes of one-to-one correspondences are invoked instead — in formulating and proving theorems of arithmetic. To make this a bit clearer, claims like '1 is a number' are now re-interpreted to mean '1 is the class of all classes standing in one-to-one correspondence with any unit class (any class containing some *x* and only that *x*).' So '1 is a number (in the Cantorian sense)' is true, but '1 is a number (an entity)' is a claim that the Russellian term buster takes no stance on, beyond showing that its truth is not assumed in their re-conception of the theorems of arithmetic. So '1 is a number (an entity)' may be true, so far as, say, *Principia* shows, but this is a claim that uses the vague concept with which we began and for which *Principia*, and mathematics has no need (as *Principia* proves). On the revisionary conceptual analysis done in *Principia* by term busting, '1 is a number (in the Cantorian sense)' is proved in *Principia* and presumed in the theorems of arithmetic as recovered in *Principia*. Indeed, without theorems of arithmetic like '1 is a number (in some sense, perhaps the Cantorian one)' and '1≠2,' it would be hard to say that the theorems of arithmetic —the data — had really been recovered consistent with *Principia*'s specific term busting proposal.

Next, I consider the sense in which this example of conceptual engineering as term busting is successful in recapturing the data. In this case, the data are theorems of arithmetic. As we saw, term busting of number terms as in the previous section results in a conceptual engineering of number notions as concepts of classes of classes in one-to-one correspondences rather than as concepts of (abstract or concrete) entities. We will see in this section that this

[11] On the Russellian account, arithmetic theorems are about relations (Russell, 1912, p. 162). Some modern philosophers prefer an ontology of classes if not one of numbers, and sometimes point to mathematical practice as supporting this account (Steinhardt, 2002, p. 356).

shows that some arithmetical data, like the apparent infinity of numbers, are not bound up with our recast concept of number and that proofs of the infinity of numbers were fallacious.

Most arithmetic theorems are readily recoverable on the Russellian account of arithmetic. Four of Peano's five sufficient axioms are readily recoverable (Whitehead & Russell, 1957b, *120). But one cannot prove generally without antecedent that finite cardinals are distinct from their successors. One only has as a theorem, for instance, that

*120.32. $\vdash: \alpha \epsilon \mathrm{NCind} \land E!\alpha \,.\supset .\, \alpha \neq \alpha +_c 1$,

that is, if α is a non-empty class in some inductive cardinal, then α is distinct from the class β produced by a class union of α with some *x* not in α (where β is the empty class if there is no such *x*). Thus, the infinity of numbers is not a datum that is recovered.

So is *Principia*'s busting of number terms successful or not? That depends on whether the infinity of inductive cardinal numbers really is a datum and has not been recovered. The alternative is that it is not really a datum and so cannot be a recovered datum. When number terms are used in arithmetic formulas, one may be tempted to assume that there are as many distinct numbers as there are distinct number terms. This is an old habit of mind going back to Euclid. Consider Euclid's proof that there are not a finite number of primes:

> Let *A*, *B*, *C* be the assigned prime numbers; I say that there are more prime numbers than *A*, *B*, *C*. For let the least number measured by *A*, *B*, *C* be taken, and let it be *DE*; let the unit *DF* be added to *DE*. Then *EF* is prime or not. (Euclid, 2002, Book IX, Proposition 20)

Euclid proceeds to show that neither possibility is consistent with the assumption that there are finitely many primes. The key point for us is that this initial construction takes for granted that a unit *DF* can always be added to a given number *DE* to get a new number *EF*.[12] In modern terms, Euclid presumes that we can always add 1 to a given number to get a different one.

Taking number terms for granted can make this feel entirely natural to do: the referential numerical concepts actualized in using number terms can lead one to imagine that each distinct number term denotes a different entity. Once number terms have been busted, we can quite readily raise serious doubts about Euclid's construction.

To see how term busting facilitates our rationally scrutinizing Euclid's assumption, recall that, on the Cantorian approach, the claim '1+1 ≠ 1' is term busted into 'there exist two distinct classes γ and δ that have the property *being 1* (= *being in the class of unit classes* β),' that is,

$$(\iota\beta)((\forall\alpha)(\alpha \epsilon \beta \supset (\exists x)(\alpha = \{x\})) \land (\exists\gamma, \delta)(\gamma \neq \delta \land \gamma \epsilon \beta \land \delta \epsilon \beta))).$$

With this redefinition of '1,' we can see that the mere use of apparently referential number terms like '1' in arithmetical sums does not guarantee the existence of at least two unit classes.

[12] More precisely, Euclid takes five postulates for granted, and these certify the procedure of adding a finite length to another one. These in turn depend on assuming that there is a potentially infinite ambient space that validates the postulates — for discussion, see (Reed, 2005, p. 71).

More generally, this helps one see that Euclid's move from an arbitrary *n* to its successor *n*+1 can be questioned because the predicate concepts that replace number terms may not apply to anything. For example, when one defines '2' (really, formulas containing '2') using one-one correlations, as in (Whitehead & Russell, 1957a, *54.02), as

$$2 =_{df} (\iota\beta)(\forall\alpha)(\alpha \in \beta \supset (\exists x, y)(\alpha = \{x\} \cup \{y\} \land x \neq y)),$$

one sees that the definition of '2' alone does not guarantee that there is such a class α in β. The linguistic change effected by eliminating number terms introduces a conceptual one, as we saw. This in turn can suggest that some data that we had taken for granted on the old numerical concept may not be data on the newly engineered one.

This is just what happens to the infinity of numbers: once we abolish number terms, Euclid's argument is undercut because the new definition shows just how the existential presupposition of '1+1≠1,' made perspicuous once we have busted number terms, could fail to be satisfied. For example, in a world wherein just one *x* existed, there would not be two distinct classes of one thing. This would leave us unable to prove that 1+1≠1 — see the commentary following (Whitehead & Russell, 1957a, *50.33).

This is as it should be on the Russellian approach: the Cantorian analysis of numbers uproots the assumption, which seemed natural when using number terms, that there are infinitely many numbers; for a detailed defence of this, see (Landini, 2011, p. 194). Busting number terms reveals that this may not really be a datum. In such cases, the data not recovered or conceived anew as not being data will have to be weighed against the fruitfulness of one's newly engineered concept. In the case of arithmetic, conceptually engineering number concepts as one-to-one correlations is a bargain: we lose the old habit of mind on which it is a datum that there are not finitely many numbers and we gain a cogent mathematics of infinity. That trade is a steal.

Is it possible to say generally how a conceptual engineer should approach the data to be recovered? Of practical necessity, any general characterizations of method in metaphilosophy will have to be somewhat rough, and the scope of data to be recovered may vary significantly in each case of term busting. But we can at least offer this necessary condition: if the conceptual engineer has term busted successfully, then the core insights of the old data are preserved. This is what we saw in the case of number terms: the theorems of arithmetic survive in a suitable recasting — perhaps with an additional antecedent claim in some limited cases. Preserving such data is vital to dissolving the metaphysical weight behind number terms because the term-buster's whole case against number terms is that they are dispensable: the old data are all capable of restatement and proof without number terms, and the axioms required for their proof are made perspicuous. Conceptual engineering as term busting thus produces a genuine scientific and philosophical advance through its preservation of certain *data*, which are bodies of statements that in some sense seem manifestly true but whose truth-conditions remain opaque to us.

What does it mean to take certain claims as data?[13] First, at no point is the overall truth of the data at issue: recovering the core insights contained in the data is a necessary condition on any successful term busting with respect to the relevant concepts. What this means is that there may be "errors of detail" as Russell calls them in the initial data, but these will be worked through in the course of analysis and should be resolved once the initial data are replaced by clearer and more precise claims through term busting.[14] So while the overall acceptability of the data like '1≠2' is not at issue, there may be other issues in the data that are not problems with the core insights but with the more philosophical aspects of them, like the view that there really are numbers or that there are infinitely many of them, and that this is required for the data like '1≠2' to be in some sense true or to be a genuine theorem of arithmetic. As Russell puts it in *Our Knowledge of the External World*, data are "matters of common knowledge, vague, complex, inexact, as common knowledge always is, but yet somehow commanding our assent as *on the whole* and *in some interpretation* pretty certainly true" (Russell, 1914, p. 65, emphasis mine).

Second, psychologically speaking, data should be the sort of thing that most will not deny.[15] Note that this does not guarantee that the data are true. Further, even if true, some of the data may undergo significant revision in conceptual engineering through term busting. This is because, as just mentioned, the details of the data, or the interpretation of it, might be wrong, especially in points of detail, even where the overall body of knowledge is broadly acceptable on some reading. It is the goal of the Russellian revisionary conceptual analyst to supply, through term busting, an interpretation that avoids these errors while still preserving the overall body of knowledge, which allows for some revision in point of detail, just as we saw in the example of *Principia*'s recovery of the theorems of arithmetic.

7. ***Principia*'s Logic as Conceptual Activism**

Cantalamessa has helpfully coined the phrase 'conceptual activism' for changing the received meaning of terms and their correlated concepts:

> … disability studies theorists will make claims … that are not conveying a truth about a disability in order to destabilize entrenched ways of thinking about disability and beliefs regarding the meaning of "disability", such as the common assumption that having a disability necessarily makes one worse off, or that the category "disability" is strictly a medical condition. They do so as a means of challenging and changing the received

[13] In answering this question, I am indebted to the discussion of analysis in (Levine, 2018, pp. 313–314) and the discussion of Russell's epistemology in (Olson & Griffin, 2019, pp. 295–296).

[14] "We are quite willing to admit that there may be errors of detail in this knowledge, but we believe them to be discoverable and corrigible by the methods which have given rise to our beliefs, and we do not, as practical men, entertain for a moment the hypothesis that the whole edifice may be built on insecure foundations. In the main, therefore, and without absolute dogmatism as to this or that special portion, we may accept this mass of common knowledge as affording data for our philosophical analysis" (Russell, 1914, p. 66). Thanks to an anonymous reviewer for helpfully suggesting that I use this passage to elaborate on the point being made in this paragraph.

[15] As a reviewer helpfully pointed out, some data belong to the more technical parts of the sciences, and so would be the sort of thing that most people who are not experts might deny. See Russell (1914, p. 66).

> meaning of "disability" and its related concepts and terms. I'll call these sorts of linguistic moves "conceptual activism". (Cantalamessa, 2021, pp. 48–49; see also p. 58 for an example)

Russellian term-busters can engage in exactly this sort of conceptual activism and do just such revision with mathematical, political, ethical, scientific, and ordinary notions. Indeed, Russell himself spilled much ink warning of the dangers inherent in ill-suited concepts, which *a prioristic* philosophical dogmas reinforce. Received concepts can become a kind of mental prison by making us mistake accidents for necessities. This is a major focus of Russell's 1912 *The Problems of Philosophy*. One of Russell's examples there comes from applied geometry:

> Some of Euclid's axioms, which appear to common sense to be necessary, and were formerly supposed to be necessary by philosophers, are now known to derive their appearance of necessity from our mere familiarity with actual space, and not from any *a priori* logical foundation. By imagining worlds in which these axioms are false, the mathematicians have used logic to loosen the prejudices of common sense, and to show the possibility of spaces differing — some more, some less — from that in which we live. (Russell, 1912, pp. 229–230)

In *Problems* and elsewhere, Russell offers many past examples of mistaking a contingent fact for a necessary one that seemed to need philosophical explanations.[16]

> In order to pretend that [a correlation or normal rule] is universal, we say that a thing is unreal when it does not fit in. You say "Any man who is a man will do such-and-such a thing." You then find a man who will not, and you say, he is not a man. (Russell, 1986b, p. 225)

Russell draws a moral from this based on a kind of pessimistic induction from past failures to prescribe metaphysical necessities onto general patterns through philosophical theorizing:

> The attempt to prescribe to the universe by means of *a priori* principles has broken down; logic, instead of being, as formerly, the bar to possibilities, has become the great liberator of the imagination, presenting innumerable alternatives which are closed to unreflective common sense, and leaving to experience the task of deciding, where decision is possible, between the many worlds which logic offers for our choice. (Russell, 1912, p. 231)

> Modern logic … has the effect of enlarging our abstract imagination, and providing an infinite number of possible hypotheses to be applied in the analysis of any complex fact. In this respect it is the exact opposite of the logic practised by the classical tradition. In that logic, hypotheses which seem *primâ facie* possible are professedly proved impossible, and it is decreed in advance that reality must have a certain special

[16] Russell's 1901 essay "Recent Work in the Philosophy of Mathematics" gives many such examples (Russell, 1993).

> character. In modern logic, on the contrary, while the *primâ facie* hypotheses as a rule remain admissible, others, which only logic would have suggested, are added to our stock, and are very often found to be indispensable if a right analysis of the facts is to be obtained. The old logic put thought in fetters, while the new logic gives it wings. (Russell, 1914, pp. 58–59)

The astounding thing about all this conceptual activism is that Russell thinks logic is the method by which to achieve it. As Russell sees it, logic clears the way for considering alternatives to seeming necessities (Landini, 2018, §4). What seemed necessary blocked free thought about the concept, but once the alternatives are duly considered, this appearance vanishes (Russell, 1912, pp. 242–244). Apparent necessities are dispelled by recognizing and classifying a richer variety of logical forms. This has the effect of enabling one to see alternative systems, axioms, and interpretations of utterances:

> In this way logic provides an inventory of possibilities, a repertory of abstractly tenable hypotheses. It might be thought that such a study would be too vague and too general to be of any very great importance, and that, if its problems became at any point sufficiently definite, they would be merged in the problems of some special science. It appears, however, that this is not the case. In some problems … the discovery of the logical form of the facts involved is the hardest part of the work and the part whose performance has been most lacking hitherto. It is chiefly for want of the right logical hypothesis that such problems have hitherto been treated in such an unsatisfactory manner, and have given rise to those contradictions or antinomies in which the enemies of reason among philosophers have at all times delighted. (Russell, 1986a, pp. 65–66; see also Russell, 1986b, p. 239)

Thus, a suitable logic is the vital tool of conceptual engineering on the Russellian account. This is why Russell affirmed as early as 1901 that a scientific revolution in philosophy would be induced by giving “the greatest possible development to mathematical logic” (Russell, 1993, p. 379). It is a real difficulty often inherent in discerning the logical form of a claim to identify what is a genuine term and what is instead a pseudo-term that should, at least for some scientific and philosophical purposes, be term busted. It is partly in light of this inherent difficulty that we can understand why Russell though that logic was the key to the sort of conceptual activism that makes for philosophical progress: term busting successfully is difficult to do with an expressive logic, and practically impossible to do without facility with logic and logical techniques.

This crucial linguistic labour practically necessary in many cases for fruitful concept revision is why Russell’s metaphilosophy made logic the essence of philosophy. So was he a conceptual engineer or a conceptual analyst? On the one hand, he asked ‘What is *X*?’ style questions like ‘What is a number?,’ ‘What is mathematics?,’ and ‘What is logic?’ On the other hand, he urged his logical and philosophical methodology not just as a means of making philosophy scientific, but as a tool for abandoning received concepts in scientific contexts and practical life, along with the mental prisons in which they place us. So I could see an argument for describing him using either phrase, which suggests that, in at least some notable cases, the phrases do not pick out metaphilosophies differing in any substantial way.

To underscore the point, consider some examples of conceptual engineering that David Chalmers (2020, pp. 4–5) gives: the concepts of supervenience, grounding, intension in Carnap, sense in Frege, implicature in Paul Grice, rigid designators in Kripke, Ned Block on consciousness, Andy Clark on the (extended) mind, epistemic injustice in Miranda Fricker, gender and race in Haslanger, and misogyny in Kate Manne. This variety in this list would have bewildered even Socrates. What exactly is not conceptual engineering if everything Chalmers mentions here falls within the paradigm?

Chalmers addresses this issue by discussing *thesis engineering* and *conceptual engineering*. Although Chalmers does not draw a sharp distinction between them, it seems that Chalmers believes that a good deal of philosophy, some of it quite good, deals with thesis engineering and not with conceptual engineering. Chalmers writes:

> Is conceptual engineering everything in philosophy? This is clearly false. Lots of important philosophy involves arguing for theses using old language, and is none the worse for that. Think of cases like Jackson's knowledge argument or Parfit's repugnant conclusion. As far as I can tell, there's no real conceptual engineering in these cases. You can use the old concepts for very interesting phenomena and theses. (Chalmers, 2020, pp. 12–13)

It is understandable why Chalmers makes this claim. Frank Jackson (1982), for example, does not claim outright that we will reengineer the concepts of experience, the physical or physical information, or qualia. Jackson even says, "… I take the question of definition to cut across the central problems I want to discuss in this paper" (Jackson, 1982, p. 127). This might lead us to think, as Chalmers does, that no conceptual engineering is transpiring in the text before us. The only thing transpiring is that one or more theses are being rejected, but the conceptual background is going unchallenged, at least for purposes of discussion.

But there does not seem to be a genuine line to draw here. Jackson (1982, p. 130) was, after all, arguing that the extension of our concept of experience cannot be wholly encompassed by physical information, and specifically that qualia will never be grasped by just communicating physical information, even if it is complete and even if the receiver of that information understands it perfectly and can recombine it as well as is possible. Is this not a rejection of one received concept of experience — the physicalist one? Or what was Jackson arguing against — just a thesis and not its conceptual backdrop? How could one argue well against a thesis only, without making its conceptual backdrop explicit?

I think that there is a challenge lurking here. Are conceptual engineers going to base their metaphilosophy on a distinction between, say, Kripke's arguments against descriptivism and his development of the concept of rigid designators? If so, how is this distinction to be maintained? As we saw, the usual slogans are hard to sustain, and the refinements of them do not show any difference in method or in metaphilosophy as between conceptual engineers and conceptual analysts. And the practice of Kripke and Jackson is difficult to tease apart here. Both advance arguments and theses. Both are rejecting certain received conceptions and proposing alternative ones. Both are developing, implicitly or explicitly, a new conception or explanation of some target phenomena. Does calling them 'conceptual engineers' or 'conceptual analysts' make a real difference? Do their practices and methods differ? I do not see that they do, but I am open to being convinced.

If anything, the example of Russell's metaphilosophy based on *Principia*'s logic shows that one can conceptually engineer received notions by term busting, that is, by asking 'What is *X*?' questions. If you have a suitably revisionary view of the purpose of philosophical activity, there is every reason to expect that conceptual revision can transpire regardless of whether the philosopher self-describes, or is described, as an 'engineer' or as an 'analyst.' My belief is that the example of Russell is entirely typical: although there are some conceptual analysts whose methodology of sticking to received concepts rankles conceptual engineers, who are rightly revolting against such sticklers for our accidental conceptual inheritances, this is the rare case. Most philosophers are happy to reject and revise concepts, whether they start by asking 'What is *X*?' or by asking 'What should *X* be?' In both cases, we can end up radically rejecting the received notions and introducing something new. So how are these metaphilosophies different really, either in methodology or in practice? If Russell can be either a conceptual engineer or a conceptual analyst, almost any contemporary philosopher can be either one, too.

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