



CHAPTER 1

On Russell's Logical Atomism

Landon D. C. Elkind

1 INTRODUCTION

Among historians of philosophy, there have been significant developments in our understanding of Russell's logical atomism. But setting aside disagreements over the details, I think it may be said that the interpretation of logical atomism, which I describe below, remains the dominant view of logical atomism among professional philosophers. I here argue against the dominant interpretation.

By way of introduction, I start with common ground between the dominant interpretation and my own. Logical atomists do claim that "there are many separate things":

The logic which I shall advocate is atomistic, as opposed to the monistic logic of the people who more or less follow Hegel. When I say that my logic is atomistic, I mean that I share the common-sense belief that there are many separate things; I do not regard the apparent multiplicity of the world as consisting merely in phases and unreal divisions of a single indivisible Reality. (*PLA*: 160)

L. D. C. Elkind (✉)
University of Iowa, Iowa City, IA, USA
e-mail: landon-elkind@uiowa.edu

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Similarly, any atoms of logical atomism are, as the name suggests, logical and not physical:

The reason that I call my doctrine *logical* atomism is because the atoms that I wish to arrive at as the sort of last residue in analysis are logical atoms and not physical atoms. Some of them will be what I call “particulars”—such things as little patches of colour or sounds, momentary things—and some of them will be predicates or relations and so on. The point is that the atom I wish to arrive at is the atom of logical analysis, not the atom of physical analysis. (*PLA*: 161)

These two quotes from the beginning of Russell’s 1918 logical atomism lectures are jointly the focus of multiple influential scholarly commentaries on Russell’s lectures:

When they are true, atomic sentences stand for the simplest complex constituents of reality, which are facts consisting of objects named by logically proper names bearing the properties, and standing in the relations, designated by predicates. (Soames 2014: 577, see also 574)

Russell’s lectures on *The Philosophy of Logical Atomism* begin with an outline sketch of what he means by ‘logical atomism’: Its basic premise is that the world contains many different things, and that to find out what these things are we need to practise what he calls ‘analysis’. The idea is that almost all familiar things are in one or another way complex, but by analysis we can find out what simpler components these complex things are put together from, and if we continue this process we should end by reaching the ultimately simple things from which all else is composed. These are the ‘atoms’, and they are called ‘logical atoms’ because they are the last residue of ‘logical analysis’, which is said to be something quite different from physical analysis. (Bostock 2012: 252)

The ‘logical’ in the label signals that the atoms are arrived at as the ‘last residue of analysis’ where the analysis is logical rather than physical ... Logical atomism is the view that in theory, if not in practice, analysis takes us down to the ultimate simples out of which the world is built. (Grayling 1996: 50–51)

Logical atomism ... is a theory about the fundamental structure of reality and so it belongs to the main tradition of western metaphysics. Its central claim is that everything that we ever experience can be analyzed into logical atoms. [Pears then quotes Russell: “the atom I wish to arrive at is the atom of logical analysis”.] (Pears 1985: 1)

The basic thesis of logical atomism ... was that the world consists of simple particulars which have only simple qualities and stand only in simple relations to one another. (Ayer 1972: 103–104)

I see here a pattern of taking the above two quotes from Russell's lectures as statements of the essence, that is, the critical theses, of logical atomism. We should add to the above two quotes Russell's views on a logically perfect language, and on acquaintance and meaning, which have led some to call logical atomism a "theory of meaning":

In a logically perfect language the words in a proposition would correspond one by one with the components of the corresponding fact, with the exception of such words as "or", "not", "if", "then", which have a different function. In a logically perfect language, there will be one word and no more for every simple object, and everything that is not simple will be expressed by a combination of words, by a combination derived, of course, from the words for the simple things that enter in, one word for each simple component. (PLA: 176)

Soames, Urmson, and Pears state the dominant interpretation's view of such statements:

It is a central aim of logical atomism to replace unanalyzed terms, predicates, and sentences-cum-propositions—which may stand in conceptual relations to one another—with logically proper names, simple unanalyzable predicates, and fully analyzed propositions. When this aim is achieved, the conceptual properties of, and relations holding among, unanalyzed expressions and sentences are traced to genuinely logical properties of, and relations holding among, fully analyzed propositions of the agent's logically perfect language. (Soames 2014: 586)

The shortest account of logical atomism that can be given is that the world has the structure of Russell's mathematical logic ... The structure of the world would thus resemble the structure of *Principia Mathematica*. That is the simple argument of the plot. (Urmson 1956: 6–7)

[Logical atomism does] start from the assumption that there is a general correspondence between language and reality, which ensures that the complete analysis of words will match the complete analysis of things ... The idea is that, when we analyze the words in our vocabulary, we soon reach a point at which we find that we cannot analyze them any further, and so we conclude that we have reached the bottom line where unanalyzable words correspond to unanalyzable things. (Pears 1985: 4–5)

The dominant interpretation of logical atomism thus emerges from an elegant synthesis of Russell's views. That is, logical atomism on the dominant reading merges (1) an ontological pluralism on which there are multiple logically independent entities, (2) a theory of meaning on which the referents of predicates and names are logically simple and mean their objects, and (3) an acquaintance epistemology that guarantees both the reference of predicates and names, and the truth of fully analyzed sentences in a philosophically ideal language. To these doctrines is added (4) an analytic program that picks apart the meaning of logically complex ordinary words and traces their meaning to logically simple words. It is this interpretative synthesis that I describe as the reading of logical atomism as "a search for complexes composed of entities with which we have acquaintance", or just "a search for acquaintance-complexes" for short.

This is the dominant reading of logical atomism. Some historians of philosophy reject this interpretation in its particulars, and some reject it in its essentials. Still, the widespread impression of logical atomism seems to be that it is essentially tied to Russell's views on acquaintance and meaning, and to an ontology of logical atoms, or perhaps necessarily existing simples.

I argue the dominant interpretation with its correlated and widespread impression of logical atomism as bound up with Russell's acquaintance epistemology is a misleading characterization of logical atomism. It is misleading because what is really crucial to logical atomism is logic. And not just any logic will do: a logical atomist needs a logic that is quite powerful, one at least that has expressive capacity sufficient to logically analyze and synthesize philosophical notions at least as complex as those of higher mathematics. A logical atomist also holds a certain view about the critical assistance of such a logic in philosophizing. A failure to make logic the essence of logical atomism produces a grossly mistaken history of logical atomism. That is, the textual data of the 1918 lectures and historical data we have about logical atomism conflict with the dominant interpretation's account of logical atomism. By *modus tollens*, the dominant interpretation is wrong.

Scholars have recently made advances in our understanding of logical atomism. This is partly because scholars have critically considered what counts as a logical atomist text, and have given increasing significance to texts beyond the 1918 lectures in their readings of logical atomism.¹ Some

of them have previously criticized the dominant interpretation, as I do here.² All this work is reflected in the current *Stanford Encyclopedia of Philosophy* article on logical atomism, which carefully details the historical origins and textual sources of logical atomism (Klement 2016: §2).³

My discussion of logical atomism here builds on and extends this work. But that work does not go far enough. I want a clean break from the dominant interpretation. The dominant interpretation's reading of logical atomism is interesting in itself. But it is just wrong. And I do not argue here that it is wrong on internal grounds. I mean that it does not correspond to what we find in the historical record and in the logical atomist texts. The dominant interpretation is a bad history of logical atomism.

I proceed as follows. In the next section, I present the dominant interpretation of logical atomism, which I call "the search for acquaintance-complexes reading". In the following two sections, I criticize interpreting logical atomism as a search for acquaintance-complexes on two grounds. First I argue that it badly fits the history of logical atomism, especially its genesis from nineteenth-century mathematics. Then I argue that it conflicts with many of Russell's remarks in the logical atomism lectures themselves, including Russell's own descriptions of logical atomism.

2 THE SEARCH FOR ACQUAINTANCE-COMPLEXES READING

In this section, I present the dominant interpretation of Russell's logical atomism. If we set aside the various minor discrepancies between authors, then we can characterize the dominant interpretation of logical atomism as a search for acquaintance complexes. I mean by an *acquaintance-complex* a complex constituted by simples that are objects of acquaintance. I first describe Russell's notions of *complex*, *logical atom*, and *acquaintance* from March 1911 to March 1918. I will keep this brief as many of the details will be familiar to readers. Then I will present the argument for the dominant interpretation of logical atomism.

2.1 *Russell's Notion of a Complex*

In the logical atomism lectures, Russell's notion of a *complex* is explicated within an ontology of facts.⁴ For Russell, a *fact* is taken as a primitive notion to be described but not defined:

When I speak of a fact—I do not propose to attempt an exact definition, but an explanation, so that you will know what I am talking about—I mean the kind of thing that makes a proposition true or false ... We express a fact, for example, when we say that a certain thing has a certain property, or that it has a certain relation to another thing ... (PLA: 163–164)⁵

Russell's facts, being taken as primitive, are not for him amendable to definition using other terms. But the sort of entity Russell means is as comprehensible as any philosophical notion. And Russell describes facts somewhat further in the 1918 lectures (and in his 1914 book—see notes). He states that they have the following four features: facts (a) are objective, (b) are the sort of entity that makes a statement true or false,⁶ (c) have constituents, and (d) have various logical forms:

1. It is important to observe that facts belong to the objective world. They are not created by our thoughts or beliefs except in special cases. (PLA: 164)⁷
2. When we speak falsely it is an objective fact that makes what we say false, and it is an objective fact that makes what we say true when we speak truly. (PLA: 164)⁸
3. The things in the world have various properties and stand in various relations to each other. That they have these properties and relations are *facts*, and the things and their qualities and relations are quite clearly in some sense or other components of the facts that have those qualities or relations. (PLA: 171)⁹
4. There are a great many different kinds of facts ... (PLA: 164)
There are, of course, a good many forms that facts may have, a strictly infinite number, and I do not wish you to suppose that I pretend to deal with all of them. (PLA: 191)¹⁰

Russell's examples of facts in 1918 include *it is raining*, *Socrates is dead*, *gravitation varies inversely as the square of the distance*, *two and two are four*, *this is white*, and *this is to the left of that* (PLA: 163, 176).¹¹

Now facts are not all alike in Russell's view: facts are rather of different sorts and are distinct in virtue of either their constituents¹² or their form (OKEW: 53, footnote 1). For example, the logical atomism lectures discuss *atomic facts*, of which there arguably two species: *positive facts* and *negative facts*. Now as Russell tells us in his 1918 lectures, he entertained

negative facts in 1914, and by 1918 he is inclined, with hesitation, to accept them (*PLA*: 187, 189–190).¹³ Russell heavily qualifies even this tentative endorsement of negative facts: “It is a difficult question. I really only ask that you should not dogmatize. I do not say positively that there are, but there may be” (*PLA*: 187).¹⁴ As another example, there are arguably also facts that are not atomic, like *general facts* and *existence facts*, and also *belief facts* and even *molecular facts*.

We need not delve into which of these Russell posited in the lectures and which he rejected. What we have so far as an explication of Russell's notion of a complex, as accounted for through his notion of a fact, is enough for our purposes here.

2.2 *Russell's Notion of a Logical Atom*

In Lecture I, Russell offers examples of logical atoms:

Some of them [the logical atoms] will be what I call ‘particulars’—such things as little patches of colour or sounds, momentary things—and some of them will be predicates or relations and so on. (*PLA*: 161)

So we have two varieties of logical atoms: particulars and relations.¹⁵ He defines *particular* as “terms of relations in atomic facts” (*PLA*: 177).¹⁶ He immediately comments on this definition to clarify that this definition is “purely logical” and that logicians do not care whether there are any particulars at all.¹⁷ He adds they are logically independent:

Particulars have this peculiarity, among the sort of objects you have to take account of in an inventory of the world, that each of them stands entirely alone and is completely self-subsistent. (*PLA*: 201)¹⁸

The notion of logical independence is critical to Russell's notion of a logical atom: it is essential to being a logical atom that it is logically independent of all other entities. As he says in 1911, complexes presuppose logical atoms, but not conversely (*AR*: 134).¹⁹ Logical atoms also exist in logical independence of each other.²⁰ Russell further suggests that the only way in which one entity depends on another is that one is a part of another.²¹ These remarks about logical independence equally apply to particulars and to relations.

From 1911 to 1918, Russell accounts for relations through an ontology of universals (*AR*: 133). He discusses universals extensively in the second and third logical atomism lectures. In 1911, he calls known universals *concepts*. It is not quite clear that he keeps this locution in the 1918 lectures, though he sometimes describes as “concepts” what are likely universals, including “the concept of humanity” (*PLA*: 231). Russell also says in a 1960 interview with Woodrow Wyatt that logical atomism is concerned with breaking apart “ideas out of which a thing is built up”.²²

In this same period, Russell accounts for logical particulars—in the sense of logically independent particulars, not in the sense of logical entities—through an ontology of sense-data. In 1911, he describes particulars that are known as *sense-data*.²³ In his 1914 “The Relation of Sense-Data to Physics”, Russell indicates that sense-data are logically independent in the required sense.²⁴ This mindset seems to carry over into the 1918 lectures, as he describes particulars as “little patches of colour or sounds” above.

We need not adjudicate these issues over Russell’s ontology here. The vital point is that a logical atom is logically independent of all other entities while all complexes are composed of them, and that simples are to be designated by the terms of a logically perspicuous language. Russell eschews giving them essential characteristics beyond such logical features. He writes:

You will note that this philosophy is the philosophy of logical atomism. Every simple entity is an atom. One must not suppose that atoms need persist in time, or that they need occupy space: these atoms are purely logical. (*AR*: 134)

The reason that I call my doctrine *logical* atomism is because the atoms that I wish to arrive at as the sort of last residue in analysis are logical atoms and not physical atoms ... The point is that the atom I wish to arrive at is the atom of logical analysis and not the atom of physical analysis. (*PLA*: 161)

Whatever other features they logically may have, it is atoms in Russell’s logical sense that are the atoms of logical atomism.²⁵

2.3 Russell’s Notion of Acquaintance

Russell describes acquaintance as follows²⁶:

I say that I am *acquainted* with an object when I have a direct cognitive relation to that object, i.e. when I am directly aware of the object itself. (*KAKD*: 149)

Acquaintance with objects essentially consists in a relation between the mind and something other than the mind ... (*PoP*: 66–67)

We shall say that we have *acquaintance* with anything of which we are directly aware, without the intermediary of any process of inference or any knowledge of truths. (*PoP*: 73)

This last point is worth stressing. Russell explicitly denies that acquaintance relations involve judgments.²⁷ Acquaintance is moreover presupposed in all other cognitive relationships.²⁸

The field of acquaintance in Russell's theory includes the following: (1) sense-data, (2) memory-data, (3) introspection-data, including both mental facts like *my seeing the sun* and *my desiring food*, and feelings like those of pain and pleasure, (4) possibly, our own Self, though Russell is unsure of this, and (5) universals, including both sensible properties like whiteness and blackness, and abstract properties like diversity. Russell writes:

We have acquaintance [1] in sensation with the data of the outer senses, and [2] in introspection with the data of what may be called the inner sense—thoughts, feelings, desires, etc.; we have acquaintance [3] in memory with things which have been data either of the outer senses or of the inner sense. Further, [4] it is probable, though not certain, that we have acquaintance with Self, as that which is aware of things or has desires towards things ... we also have acquaintance [5] with what we shall call *universals*, that is to say, general ideas, such as *whiteness*, *diversity*, *brotherhood*, and so on. (*PoP*: 80–81, see also 75–77)

There are again many interesting issues involved in Russell's acquaintance epistemology. But we have enough to grasp the argument for the dominant reading of logical atomism.

2.4 *The Argument for the Dominant Reading*

Logical atomism as the search for acquaintance-complexes, then, is the philosophical program of searching for complexes composed of entities with which we are acquainted. J. O. Urmson aptly summarizes this interpretation of logical atomism:

In the period from 1905 to 1919 Russell attempted to give a reductionist account of empirical knowledge; the basic materials were sense data; the methodological maxim was to replace inferred entities by logical constructions whenever possible, and the theory of descriptions was the main logical tool. (Urmson 1969: 510)

On this reading, Russell's logical atomism depends on both an epistemology with a theory of acquaintance and an ontology including entities with which we metaphysically can stand in acquaintance relations. Let us consider these two doctrines in turn.

A logical construction, as the name suggests, is constructed from something. Russell's language is frequently suggestive of constructing logical complexes from logical atoms.²⁹ This is why Urmson mentions "basic materials". Now the materials are entities, but what makes "basic" is also their epistemological status. This is where logical atoms enter into logical atomism on the dominant interpretation on that reading, logical atoms are both the epistemological and logical foundation, really the essence, of logical atomism.

Followers of the dominant interpretation, following Russell's remark above, thus understand logical atomism as committed to logical atoms, namely, particulars, qualities, and relations (Pears 1985: 2). D. F. Pears writes, "[Logical atomism's] central claim is that everything we ever experience can be analyzed into logical atoms" (Pears 1985: 1). This commitment arises for epistemological and logical reasons.

The epistemological reasons are as follows. The scope of experience is limited to objects and facts with which we have *acquaintance* in Russell's sense.³⁰ This interpretative claim is based on Russell's formulation of a "fundamental principle" of analysis³¹:

All analysis is only possible in regard to what is complex, and it always depends, in the last analysis, upon direct acquaintance with the objects which are the meanings of certain simple symbols. (*PLA*: 173)

The fundamental principle forces upon us an identification of logical atoms and epistemological atoms. This brings us to Russell's further claim about the structures of both logical analysis and epistemological justification:

All our knowledge, both knowledge of things and knowledge of truths, rests upon acquaintance as its foundation. (*PoP*: 73; see also 175–176)

All analysis is only possible in regard to what is complex, and it always depends, in the last analysis, upon direct acquaintance with the objects which are the meanings of certain simple symbols. (*PLA*: 173)

In *Problems*, Russell holds an *acquaintance epistemology*, the view that non-inferential justification is given by acquaintance, acquaintance being a relation of direct awareness that is not conceptual, judgmental, or representational.³² Russell also affirms *epistemological foundationalism*, the view that all justification chains terminate in non-inferential justification. These two claims require epistemological atoms—particulars and relations for Russell—with which we have acquaintance at the base of our justificatory structure. Russell also claims that logical analysis necessarily terminates, if it does, with logical atoms. Crucially, these logical atoms must be objects of acquaintance. We thus have an identification of logical atoms and epistemological atoms: logical atoms are just the entities and facts upon which all knowledge epistemologically depends, and epistemological atoms are just the logically independent entities that are the constituents of facts. Thus Russell adopted logical atomism through an independently motivated “fundamental principle” that in turn led to a foundationalism about analysis: this manifested itself in the view that all words for logical atoms comprehended by a speaker mean objects of acquaintance—such a word being “a symbol whose parts are not symbols” (*PLA*: 173). Pears writes:

So when analysis could proceed no further, he appealed to acquaintance or direct experience ... Russellian analyses proceed by way of definitions, terminate with indefinables, and, at that point, base themselves upon acquaintance. (Pears 1985: 8)

This is the first half of logical atomism understood as the search for acquaintance-complexes. The other half is an ontology with objects of acquaintance upon which we can ground empirical knowledge. These are to be the atoms of logical atomism. The epistemology and the ontology go hand-in-hand on the dominant interpretation, underscoring the need for atoms on this reading. Pears writes:

An atom is something indivisible or not further analyzable. A logical atomist, therefore, needs to show not only that the divisions traceable in logic correspond to real divisions in the nature of things, but also that the two corresponding processes of analysis do not continue indefinitely. If Russell is right, there must be a point at which words and things will be found to be not further analyzable. (Pears 1985: 2)

The need for atoms is imposed by the need for the analysis of words to terminate along with the thesis that there is a close correspondence between the analysis of the world and the analysis of language.³³ As we saw above, Russell claims analysis depends on a complex being capable of separation into components. The components of facts will moreover be logically independent of each other. Russell writes:

It is quite clear that in that sense there is a possibility of cutting up a fact into component parts, of which one component may be altered without altering the others, and one component may occur in certain other facts though not in all other facts. I want to make it clear, to begin with, that there is a sense in which facts can be analyzed. (*PLA*: 172)

And as we saw, in his 1911 “Analytic Realism”, he says complexes presuppose logical atoms, but not conversely (*AR*: 134). And Russell holds that a logical atom is logically independent of every other one. Indeed, each atom logically could be the only entity that exists.³⁴ And expressions whose meaning is some atom will be simple symbols whose meanings can be understood independently of understanding the meaning of any other word.³⁵ So for a logical atomist on the dominant reading, there is necessarily a close correspondence between words and objects:

We may lay down the following provisional definitions:

That the components of a proposition are the symbols we must understand in order to understand the proposition;

That the components of the fact which makes a proposition true or false, as the case may be, are the *meanings* of the symbols which we must understand in order to understand the proposition. (*PLA*: 175)

Moreover, words standing for atoms will be understood, necessarily and sufficiently, by acquaintance.³⁶ Russell’s example of such a word is the word “red”: he argues “red”, unlike complex symbols, cannot be understood except through acquaintance with red objects.³⁷ And by the close correspondence of language and the world, given that there are such words for atoms like “red”, there are logical atoms that are the meaning of such simple symbols.³⁸

So one might interpret the text of the lectures as requiring an ontology of logical atoms. There are a number of problems with that argument that have been much-discussed.³⁹ But the point that matters for present purposes is the sketch of the dominant interpretation of logical atomism

as the search for acquaintance-complexes. This reading proposes an intriguing union of epistemological theory of acquaintance and of an ontological theory with simples, all interwoven with a theory of meaning on which the structure of all facts would be made logically perspicuous in an ideal language. It is a captivating idea that remains the dominant reading of logical atomism among philosophers. Yet I argue that this reading of logical atomism does not make logic central to logical atomism: consequently, it poorly fits the history of logical atomism and the text in the 1918 lectures.

3 THE LOGICO-MATHEMATICAL ORIGINS OF LOGICAL ATOMISM

Viewing Russell's logical atomism as the search for acquaintance-complexes poorly fits the historical record. In particular, it fails to explain three historical facts: (1) nineteenth-century mathematical developments, especially the logical work of Peano and Frege and the work of Cantor, are central to logical atomism; (2) logic is central to logical atomism; and (3) logical atomism is supposed to be what Russell calls a "scientific philosophy". Let us start with (1).

Russell's intellectual autobiography, *My Philosophical Development*, begins as follows:

There is one major division in my philosophical work: in the years 1899–1900 I adopted the philosophy of logical atomism and the technique of Peano in mathematical logic. (*MPD*: 9)

There is good reason to be suspicious of Russell's remark. For starters, the date is debatable.⁴⁰ We have no evidence Russell used the phrase "logical atomism" before 1911: indeed, Russell's first use of "logical atomism" was in French.⁴¹ So we should critically examine what led Russell in 1959 to call himself a "logical atomist" over a decade before he first used the French equivalent of the phrase "logical atomism".

A clue to Russell's meaning comes from the date plus the phrase "the technique of Peano in mathematical logic".⁴² Russell in 1901 wrote an essay explaining the importance to philosophy of recent work on mathematics, especially work on mathematical logic by Peano and others. This essay was his 1901 "Recent Work in the Philosophy of Mathematics".⁴³

Most of the essay concerns philosophers continuing longstanding controversies about, among other things, the nature of continuity, space, time, infinity, points, and number. Nineteenth-century mathematicians in contrast undertook technical work that dissolved many of these controversies. Philosophers contented themselves with a priori refutations of mathematics. Mathematicians rolled up their sleeves and labored to clarify mathematical notions so as to make mathematics intelligible. Russell stresses that the mathematicians were in the right.

The piece consists in a pattern repeated throughout the essay. The pattern is a discussion of some philosopher's argument against a mathematical notion, followed by a summary of some mathematician's new definition that shows the argument was founded on a faulty and confused view of that notion. Russell's discussion of infinity nicely illustrates the pattern. Let us consider it.

As Russell tells the story, philosophers had for centuries held infinite numbers "were self-contradictory"; but it seemed obvious that there are infinite numbers like the number of whole numbers (*RWPM*: 372). The purported self-contradiction arose from the following fact: an infinitely large collection is sometimes equal in size to an infinitely large proper sub-collection (*RWPM*: 373). For example, the collection of whole numbers is equal in cardinality to the collection of even whole numbers even though the second collection is a proper sub-collection of the first. This contradicts the seemingly obvious thesis that a sub-collection s is smaller than any collection S of which s is a proper part (*RWPM*: 373). But mathematicians like Cantor and Dedekind showed that the violation of this thesis that the proper part has a smaller size than the whole, far from being contradictory, can actually be used to define infinite numbers (*RWPM*: 372–373).⁴⁴

Russell reconsiders philosophers' past discussions of infinity in light of mathematicians' recent work, especially Cantor's. He notes metaphysicists had failed to solve conceptual difficulties associated with the infinite. Mathematicians in contrast dissolved those difficulties:

Thus on the subject of infinity it is impossible to avoid conclusions which at first sight appear paradoxical, and this is the reason why so many philosophers have supposed that there were inherent contradictions in the infinite. But a little practice enables one to grasp the true principles of Cantor's doctrine, and to acquire new and better instincts as to the true and the false. The oddities then become no odder than the people at the antipodes, who used to be thought impossible because they would find it so inconvenient to stand on their heads. (*RWPM*: 376)

So first we have purported contradictions that plagued the philosophy of infinity for centuries. Then we have technical, mathematical work in the nineteenth century dissolving the purported contradictions. Facility with the new mathematics of infinity was sufficient to dissolve entirely philosophical debate over infinity, at least among those familiar with the new mathematics of infinity. Russell believed that this fruitful pattern was typical of a general development in all philosophy of mathematics:

In the whole philosophy of mathematics, which used to be as full of doubt as any other part of philosophy, order and certainty have replaced the confusion and hesitation which formerly reigned. Philosophers, of course, have not yet discovered this fact, and continue to write on such subjects in the old way. But mathematicians, at least in Italy [Peano and his school], have now the power of treating the principles of mathematics in an exact and masterly manner, by means of which the certainty of mathematics extends also to mathematical philosophy. Hence many of the topics which used to be placed among the great mysteries—for example, the natures of infinity, of continuity, of space, time and motion—are now no longer in any degree open to doubt or discussion. Those who wish to know the nature of these things need only read the works of such men as Peano or Georg Cantor; they will find there exact and indubitable expositions of all these quondam mysteries. (*RWPM*, 369)

Russell further believes that the introduction of “order and certainty” in the philosophy of infinity can be utilized not just in the philosophy of mathematics, but in all of philosophy. He hopes that the spread of logical and mathematical techniques in philosophy over other areas of controversy will spread order and certainty throughout philosophy. His 1901 essay ends with this recommendation to let logic develop as freely as possible with the strong conviction that logic stands to bring “exactitude and certainty” to all of philosophy:

What is now required is to give the greatest possible development to mathematical logic, to allow to the full the importance of relations, and then to found upon this secure basis a new philosophical logic, which may hope to borrow some of the exactitude and certainty of its mathematical foundation. If this can be successfully accomplished, there is every reason to hope that the near future will be as great an epoch in pure philosophy as the immediate past has been in the principles of mathematics. (*RWPM*: 379)

His belief in the resolving power of logic for longstanding philosophical problems is then recorded quite early. What has been neglected is that nineteenth-century mathematics was the inspiration for logical atomism. Indeed, his concluding recommendation in the 1901 essay animates Russell's philosophical works thereafter: he urges giving the widest scope to mathematical logic and the logic of relations in the hopes that such development will produce a new logic; a new logic in turn will induce a "great epoch" in philosophy brought about by the emergence of what Russell calls "scientific philosophy". What Russell meant in 1959 by connecting logical atomism to "the technique of Peano" was this: nineteenth-century mathematics—its development of piecemeal technical work within a powerful logic, followed by the dissolution of philosophical problems—was the model for logical atomist philosophy.

The centrality of nineteenth-century mathematics to logical atomism is the historical fact (1) above. And I argue below that this historical fact is unexplained by the dominant reading of logical atomism. But let us first consider the impact of nineteenth-century mathematics on Russell, which brings us to what I denoted by (2) and (3) above: after his encounter with the work of Peano, (2) logic became central to his logical atomist philosophy and (3) logical atomism was to be a "scientific philosophy". Both (2) and (3) occur throughout Russell's writings after 1901, and especially from 1911 to 1924. Here is a collection of occurrences of (2) and (3) in Russell's works from 1911 to 1945:

The true method, in philosophy as in science, should be inductive, meticulous, respectful of detail, and should reject the belief that it is the duty of each philosopher to solve all problems by himself. It is this method which has inspired analytic realism [that is, "logical atomism" (*AR*: 135)], and it is the only method, if I am not mistaken, with which philosophy will succeed in obtaining results as solid as those obtained in science. (*AR*: 139)

Philosophy, from the earliest times, has made greater claims, and achieved fewer results, than any other branch of learning ... I believe that the time has now arrived when this unsatisfactory state of things can be brought to an end ... The problems and the method of philosophy have, I believe, been misconceived by all schools, many of its traditional problems being insoluble with our means of knowledge, while other more neglected but not less important problems can, by a more patient and adequate method, be solved with all the precision and certainty to which the most advanced sciences have attained ... [Logical atomism] represents, I believe, the same kind of

advance as was introduced by Galileo: the substitution of piecemeal, detailed, and verifiable results for large untested generalities recommended only by a certain appeal to imagination. (*OKEW*: 3–4)

The philosophy, therefore, which is to be genuinely inspired by the scientific spirit, must deal with somewhat dry and abstract matters, and must not hope to find an answer to the practical problems of life. (*OKEW*: 29)⁴⁵

It is in this way that the study of logic becomes the central study in philosophy: it gives the method of research in philosophy, just as mathematics gives the method in physics. (*OKEW*: 239)

It is not results, but *methods*, that can be transferred with profit from the sphere of the special sciences to the sphere of philosophy. (*SMP*: 57)⁴⁶

First, the detailed scientific investigation of nature does not *presuppose* any such general laws as its results are found to verify. Apart from particular observations, science need presuppose nothing except the general principles of logic, and these principles are not laws of nature, for they are merely hypothetical, and apply not only to the actual world but to whatever is *possible*. (*SMP*: 61)

A scientific philosophy such as I wish to recommend will be piecemeal and tentative like other sciences; above all, it will be able to invent hypotheses which, even if they are not wholly true, will remain fruitful after the necessary corrections have been made. The possibility of successive approximations to the truth is, more than anything else, the source of the triumphs of science, and to transfer this possibility to philosophy is to ensure a progress in method whose importance it would be almost impossible to exaggerate. (*SMP*: 66)⁴⁷

The adoption of scientific method in philosophy, if I am not mistaken, compels us to abandon the hope of solving many of the more ambitious and humanly interesting problems in philosophy. Some of these it relegates, though with little expectation of a successful solution, to special sciences, others it shows to be such as our capacities are incapable of solving. But there remain a large number of the recognized problems in philosophy in regard to which the method advocated gives all the advantages of division into distinct questions, of tentative, partial, and progressive advance, and of appeal to principles with which, independently of temperament, all competent students must agree. The failure of philosophy hitherto has been due in the main to haste and ambition: patience and modesty, here as in other sciences, will open the road to solid and durable progress. (*SMP*: 73)

Philosophical knowledge, if what we have been saying is correct, does not differ essentially from scientific knowledge ... and the results of obtained by philosophy are not radically different from those reached in science. (*OoP*: 308)⁴⁸

I have no doubt that, in so far as philosophical knowledge is possible, it is by such methods [as logical analysis] that it must be sought ... (*HWP*: 862)⁴⁹

Russell here takes logic to be central to philosophy, logical atomism. Note that his suggestions for the development of logic are modeled on the development of nineteenth-century mathematics as described in his 1901 “Recent Work on the Philosophy of Mathematics”. And when Russell describes the scientific philosophy, that is, philosophy as distinguished from empirical science, what he says describes just logic:

... certain characteristics may be noted as distinguishing the province of philosophy from that of the special sciences.

In the first place a philosophical proposition must be general ... I do believe that a philosophical proposition must be applicable to everything that exists or may exist ... What I do maintain is that there are general propositions which may be asserted of each individual thing, such as the propositions of logic ... The philosophy which I wish to advocate may be called logical atomism or absolute pluralism, because, while maintaining that there are many things, it denies that there is a whole composed of those things. We shall see, therefore, that philosophical propositions, instead of being concerned with the whole of things collectively, are concerned with all things distributively; and not only must they be concerned with all things, but they must be concerned with such properties of all things as do not depend upon the accidental nature of the things that there happen to be, but are true of any possible world, independently of such facts as can only be discovered by our senses.

This brings us to a second characteristic of philosophical propositions, namely, that they must be a priori. A philosophical proposition must be such as can be neither proved nor disproved by empirical evidence. [...]

We may sum up these two characteristics of philosophical propositions by saying that *philosophy is the science of the possible*. But this statement unexplained is liable to be misleading, since it may be thought that the possible is something other than the general, whereas in fact the two are indistinguishable.

Philosophy, if what has been said is correct, becomes indistinguishable from logic as that word has now come to be used. (*SMP*: 64–65)

Now one might argue Russell’s emphasis on mathematical logic as the way to make philosophy scientific is a general feature of Russell’s philosophy after his discovery of Peano. That need not imply that logic is central to logical atomism. So logic need not be central to logical atomism, except in that logical atomism is part of philosophy. But the text flatly contradicts

that suggestion. Russell rather makes logic the essence of logical atomism. He says explicitly that logical atomism emerged from the new mathematical logic both in his logical atomism lectures and in his 1924 “Logical Atomism”:

The kind of philosophy that I wish to advocate, which I call Logical Atomism, is one which has forced itself upon me in the course of thinking about the philosophy of mathematics, although I should find it hard to say exactly how far there is a definite logical connexion between the two ... In the present lectures, I shall try to set forth in a sort of outline, rather briefly and rather unsatisfactorily, a kind of logical doctrine which seems to me to result from the philosophy of mathematics—not exactly logically, but as what emerges as one reflects: a certain kind of logical doctrine, and on the basis of this a certain kind of metaphysic. (*PLA*: 160)

Also I found myself driven to pluralism. Analysis of mathematical propositions persuaded me that they could not be explained as even partial truths unless one admitted pluralism and the reality of relations ... I began to think it probably that philosophy had erred in adopting heroic remedies for intellectual difficulties, and that solutions were to be found merely by greater care and accuracy. (*LA*: 162–163)

Russell says that logical atomism, as he understands his own view, is inspired by the positive achievements of Peano, Cantor, Weierstrass, Dedekind, and Frege using the new mathematical logic. Russell sees logical atomism as a patient, precise, and dry method of philosophizing, and to identify the method of sound philosophizing with the new mathematical logic:

It [the new logic] has, in my opinion, introduced the same kind of advance into philosophy as Galileo introduced into physics, making it possible at last to see what kinds of problems may be capable of solution, and what kinds must be abandoned as beyond human powers. And where a solution appears possible, the new logic provides a method which enables us to obtain results that do not merely embody personal idiosyncrasies, but must command the assent of all who are competent to form an opinion. (*OKEW*: 59)

Therefore every advance in knowledge robs philosophy of some of the problems which formerly it had, and if there is any truth, if there is any value in the kind of procedure of mathematical logic, it will follow that a number of problems which had belonged to philosophy will have ceased to belong to philosophy and will belong to science ... It [applying mathematical logic to philosophical problems] makes it [philosophy] dry, precise, methodical ... (*PLA*: 243)

Let us summarize what we have found. Despite having only used the phrase “logical atomism” in March 1911, some historical facts are accurately reported by Russell’s remark that he became a logical atomist in 1899–1900. First, he learned the new logic. He immediately applied it, and in a sense used logical atomism’s method—the new logic—before he ever coined the term “logical atomism”. This makes good sense if logic is central to logical atomism. And Russell indeed claims logic is central to logical atomism. This is historical fact (2) above.

Second, the centrality of logic is critical to understanding why Russell believes the method of logical atomism—the new logic—can help philosophy become scientific. Taking his cue from the revolutionary impact of nineteenth-century mathematics, Russell believed that making logic central to philosophizing would make philosophy itself scientific, and distinctly scientific in a way that was not feasible without making logic central. This is historical fact (3) above.

Now interpreting logical atomism as a search for acquaintance-complexes fits these two historical facts about logical atomism quite poorly. Consider fact (2). One could argue for the existence of atomic facts, an ontology including logical simples, and acquaintance epistemology without applying mathematical logic in, and making logic central to, philosophy.⁵⁰ One does not need to engage in much logic at all to advocate for these views. And a search for acquaintance-complexes is in no sense “precise, dry, methodical” as the new logic is. A search for acquaintance-complexes is not a “*science of the possible*”. And it does not make philosophy “indistinguishable from logic as that word has come to be used”. One cannot be a logical atomist, according to Russell, without applying logic in, and making logic central to, philosophy. But you could be a logical atomist without doing this on the dominant interpretation of logical atomism. The dominant view thus insufficiently accounts for the logical methods of logical atomism and for the general use of logic in philosophy, which Russell insists is vital to logical atomism.

Now consider fact (3). The dominant interpretation poorly explains the supposedly scientific aspect of logical atomism that was inspired by its logico-mathematical origins, including its genesis from nineteenth-century mathematical work that Russell encountered in 1899–1900 before he ever adopted the acquaintance theory and views about simples that we find in the 1910s. Indeed, logical atomism is older than Russell’s acquaintance epistemology and ontology of sense-data and relations, and it survives their demise. What does not change in this period is Russell’s firm belief in

the vital importance of logic for making philosophy “scientific”. Russell held that nineteenth-century mathematics did make philosophy of mathematics scientific, and logical atomism was supposed to make all philosophy similarly “dry, precise, methodical”, as logic is. This makes sense of Russell’s claim to be a logical atomist from 1899–1900 onward. And making logic central to logical atomism accounts for why Russell thought that the introduction of the new logic was an “advance” in philosophy rivaling Galileo’s advance in physics. On the other hand, viewing logical atomism as a search for acquaintance-complexes produces a philosophy that is not at all scientific in Russell’s sense. On the dominant interpretation, logical atomism is not piecemeal or progressive: it is a typical traditional philosophy that does not merit any of the remarkable claims about progress Russell asserts for it.

Viewing logical atomism as a search for acquaintance-complexes does not fit the actual development of logical atomism from 1899–1900 onward through various texts. Even limiting ourselves to Russell’s works after his 1911 “Analytic Realism”, where he first used the phrase “logical atomism”, helps very little: Russell repeatedly points to nineteenth-century mathematical work in discussing what led him to the philosophy of logical atomism.

Understanding logical atomism as the search for acquaintance-complexes fails to explain why Russell traced the origins of logical atomism to mathematical logic. Simply put, the age of logical atomism and its reliance on mathematical logic on this interpretation are inexplicably accidental.⁵¹ As I hope the foregoing summary shows, this reading conflicts with Russell’s explicit statements in his 1918 logical atomism lectures, in his 1924 “Logical Atomism”, in his 1914 *Our Knowledge of the External World*, in his 1914 “On Scientific Method in Philosophy”, and in his 1911 “Analytic Realism”, all of which are logical atomist works, and with Russell’s intellectual autobiography. It thus conflicts with an abundance of evidence as to the logico-mathematical origins of logical atomism. The dominant interpretation is a bad history.

4 DIRECT TEXTUAL EVIDENCE AGAINST THE DOMINANT READING

Interpreting logical atomism as a search for acquaintance-complexes also conflicts directly with the text of the lectures. Near the beginning of Lecture IV Russell remarks:

I think one might describe philosophical logic, the philosophical portion of logic which is the portion that I am concerned with in these lectures since Christmas [1917], as an inventory, or if you like a more humble word, a “Zoo” containing all the different forms that facts may have ... In logic you are concerned with the forms of facts, with getting hold of the different sorts of facts, different *logical* sorts of facts, that there are in the world. (PLA: 191)⁵²

Now I submit that Russell does exactly logic, as he describes logic above, in the 1918 lectures on logical atomism. Just look at the table of contents for the logical atomism lectures⁵³:

- I. Facts and Propositions
- II. Particulars, Predicates, and Relations
- III. Atomic and Molecular Propositions
- IV. Propositions and Facts with More than One Verb; Beliefs, Etc.
- V. General Propositions and Existence
- VI. Descriptions and Incomplete Symbols
- VII. The Theory of Types and Symbolism: Classes
- VIII. Excursus into Metaphysics: What There Is (PLA: 155)

To see that the logical atomism lectures are a work of logic, let us expand on its table of contents. Lecture I introduces facts and the notion of forms of facts.⁵⁴ Lecture II analyzes atomic facts and atomic propositions.⁵⁵ Lecture III discusses the purported need for molecular facts.⁵⁶ Lecture IV treats the need for belief-facts.⁵⁷ Lecture V concerns existence facts and general facts.⁵⁸ Lectures VI and VII deal with logic itself. Lecture VI deals with incomplete symbols.⁵⁹ Lecture VII concerns type theory.⁶⁰ Thus, all but his last lecture deal with logical forms of facts or with logic itself. That is why Russell styles Lecture VIII as an “excursus” and also why he begins Lecture VIII by remarking that it breaks from the themes of the seven earlier lectures:

I come now to the last lecture of this course, and I propose briefly to point to a few of the morals that are to be gathered from what has gone before, in the way of suggesting the bearing of the doctrines that I have been advocating upon various problems of metaphysics. I have dwelt hitherto upon what one may call philosophical grammar, and I am afraid I have had to take you through a good many very dry and dusty regions in the course of that investigation, but I think the importance of philosophical grammar is very much greater than it is generally thought to be. (PLA: 234)

Logic, or “philosophical grammar”, is again critical to scientific philosophy as Russell understands it: that is why he spends seven of eight lectures on logical atomism dealing with logic in the sense we saw above. This point is worth emphasizing. The dominant reading would suggest that logical atomists are concerned with discovering the logical simples and arguing for an acquaintance epistemology. Russell’s practice in these lectures, save for a one-lecture “excursus”, is instead to consider what the logical forms of facts are. Indeed, his discussion of particulars and relations in Lecture II is explicitly concerned with the logical form of atomic facts, and Russell tells us that he is not interested in what particulars there are, if any, but only in the logical characterization of constituents of atomic facts. Rather than search for acquaintance-complexes, as we would expect on the dominant interpretation, Russell’s practice in the logical atomism lectures is to do logic. The dominant interpretation gets logical atomist practice wrong.

It may help to clarify this point to consider why Russell believes that mathematical logic is critical to scientific philosophy as Russell understands it. Russell holds that one cannot form the requisite stockpile of logical forms to attack philosophical problems without a robust logic:

Now I want to say that if you wish to test such a theory as that of neutral monism, if you wish to discover whether it is true or false, you cannot hope to get any distance with your problem unless you have at your fingers’ end the theory of logic that I have been talking of. (*PLA*: 242, see also 235)

Russell is not equivocal on this issue: mathematical logic is critical to logical atomism. The reason is that we can hardly make philosophical progress in examining a view without a large stockpile of logical forms or without a powerful logic. The logical examination of a theory is impossibly hindered by a limited logic.

The answer to this limitation is to create a stockpile of logical forms of facts using the powerful new logic. And this is precisely what Russell does, as he tells us when he describes his subject in the logical atomism lectures as an inventory of logical forms that facts may have. The logical atomism lectures are a work describing a search for logical forms, not a search for acquaintance-complexes. It is no accident that Russell calls the logical atomism lectures his “logic lectures” both in correspondence.⁶¹ Even in his appointment diary, a page of which is pictured in Fig. 1.1, Russell refers to the logical atomism lectures as “LL” for “logic lectures”.⁶²

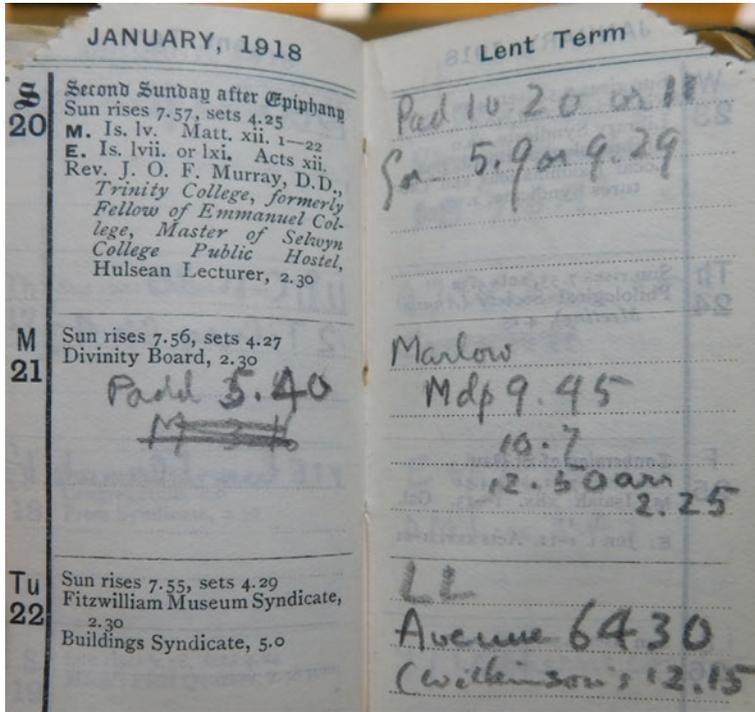


Fig. 1.1 Russell's appointment diary for 20–22 January 1918

There is no denying what is firmly and uniformly supported by documents contemporaneous with and the text of the logical atomism lectures: the logical atomism lectures are a logic book.⁶³

Above all, the text of the logical atomism lectures focuses on, and is organized around, the search for logical forms: this is the stockpiling of logical forms of facts that Russell playfully describes as the inventory of a logical zoo. The text thus conflicts with understanding logical atomism as a search for acquaintance-complexes, even when we confine ourselves to the text and ignore the wider historical context. Having a robust logic, on the dominant reading, is at best just a helpful means for more effectively rendering the truth-conditions of statements in terms of acquaintance-complexes. But this is contrary to the logical atomist practice that we find in the lectures. What Russell in fact makes the center of logical atomism, namely, a

robust logic as a means of stockpiling logical forms of facts and logical theses for use in testing possibilities, is exhibited in his practice of searching for logical forms of facts. He does not search for acquaintance-complexes. Again, on the dominant interpretation, the connection of logic to logical atomism is, if fortuitous, accidental. But what we find in the text is logic being used throughout the essential work of classifying logical forms.

Defenders of the dominant interpretation have actually seen this as a virtue of their view. Urmson, for example, says in his 1956 treatment of logical atomism that we can neglect all the “advanced and difficult” parts of Russell’s logic:

Since the metaphysics is thus dependent on the logic, it is clearly indispensable to have some sort of understanding of what sort of logic it is and of the concepts it employs if we are to understand the metaphysics. For our purposes the more advanced and difficult parts of the logic are luckily less important than the most simple and no reference need be made to them. (Urmson 1956: 7–8)

For Urmson, the only necessary parts are those that help us “to understand the metaphysics”, and not any parts, if any, that are specially necessary to understand the logical form.

Urmson then discusses truth-functional connectives and truth-functional tautologies and contradictions, omitting quantification theory (Urmson 1956: §2.B). He then says that logicians speak “indifferently about all statements whatever their content or structure” (Urmson 1956: 8). This suggests his view of logical atomism confines the logic of logical atomism to a system of propositional logic in which logical truths are all tautologies, and all non-logical truths are atomic statements, unlike, say, the statement “all humans are mortal”. Urmson writes:

... the formal logician regards himself as supplied with an indefinite number of propositional variables, p , q , r , &c.; since he does not inquire into their structure we may say that they are simple relative to his system. Since he has no logical means of determining the truth or falsehood of the constituents [statements] he limits his interest to those of the functions which can be recognized to be true or false by logical methods—the tautologies and contradictions. Since it is the tautologies which are of importance for research into the foundations of mathematics, this suits him perfectly ... So much must suffice as an explanation of the ideas of elementary logic which were adapted for use in the metaphysics of logical atomism. (Urmson 1956: 11; see also 14)

This conflicts with the fact that Russell's logic is far richer than this, and the fact that logical atomist inventory of logical forms goes beyond tautologies and contradictions. Russell writes:

The technical methods of mathematical logic, as developed in this book [*Principia*], seem to me very powerful, and capable of providing a new instrument for the discussion of many problems that have hitherto remained subject to philosophical vagueness. (*LA*: 163)

The elimination of “philosophical vagueness” is aided by the fact that the language of *Principia* shows “at a glance” the logical form of the facts involved in a statement being true or false (*PLA*: 176). But confining ourselves to a logic as weak as propositional logic, as Urmson does, or even to a first-order logic, destroys all the examples from *Principia* of logical atomism's success. Russell cites, as examples of logical atomism's success, the analyses of number (*PLA*: 234), classes (*PLA*: 228), matter (*PLA*: 235–236), definite descriptions (*LA*: 165–166), series and ordinals (*LA*: 166), ordinary objects (*PLA*: 236–237), points and instants (*LA*: 166), matter (*LA*: 166–167), and mind (*LA*: 167). Propositional logic is far too weak to recover the analyses given in *Principia* of purely mathematical notions like number and class. And a system too inadequate to recover the analyses in *Principia* cannot be taken what Russell meant in describing logic as central to logical atomism. This weighs heavily against Urmson's indication of propositional logic as giving the essentials of what Russell had in mind. And it more generally suggests that the dominant interpretation, which at best accounts for Russell's examples of logical atomist analyses as happy accidents only loosely connected with the search for acquaintance-complexes, has gotten something deeply wrong in its interpretation of logical atomism.

And, for someone who is, supposedly, deeply committed to searching for acquaintance-complexes, Russell is remarkably unconcerned with justifying the existence of logical atoms or with sketching a foundationally structured justification tree for human knowledge.⁶⁴ Russell is far more concerned in the logical atomism lectures with classifying logical forms of facts. The dominant interpretation fails to explain why Russell focuses on logical forms throughout the lectures. The dominant interpretation does not explain why Russell views logic as “what is fundamental in philosophy”

or why Russell thinks logical atomism will make philosophy scientific.⁶⁵ It does not even fit Russell's description of these lectures as his "logic lectures".

The dominant interpretation of logical atomism as a search for acquaintance-complexes, though alluring, is the sort of traditional philosophical view that Russell explicitly contrasts with his own. It conflicts with the logical focus, especially the logical atomist practice of searching for logical forms, that we find in the text of the 1918 logical atomism lectures. The dominant interpretation is a historically inaccurate and textually inadequate view of logical atomism.

5 RUSSELL'S LOGICAL ATOMISM

Interpreting logical atomism as a search for acquaintance-complexes composed of ontological simples has inspired rich scholarly discussion. But the dominant interpretation:

1. fails to connect its reading to Russell's remarks about logical atomism and its origins;
2. fails to incorporate Russell's view that a powerful logic is critical to the view;
3. fails to match Russell's logical atomist practice in, and the content of, the lectures.

This historical evidence shows the dominant reading is wrong. What, then, is logical atomism?

Logical atomism is what we might call a "logic-first and logic-last" philosophy (*SMP*: 65). A logical atomist starts by giving a logical system (*LA*: 162). A vital test of a proposed logical system will be its adequacy to certain data that we accept as true (*LA*: 163). A philosophically fruitful logical atomism will require an expressively adequate logic to generate a large variety of logical forms (*OKEW*: 42–43). Logical atomism thus requires a higher-order logical framework. It is the logical atomist's use of a powerful logic that makes logical atomist philosophy distinctively scientific in Russell's sense (*AR*: 139). Where logic does not settle a philosophical issue, the possibilities are open (*SMP*: 72–73). And for traditional philosophers that find Russell's logical atomism and its logic-heavy practice disappointing or difficult, Russell has some unsympathetic advice: "acquire a taste for mathematics" (*PLA*: 243–244).

NOTES

1. Bostock rightly considers the logical atomist period beyond the 1918 lectures (Bostock 2012: vi–vii). Linsky’s recent work on logical constructions closely follows the connections between earlier and later works, and he rightly links logical constructions to Russell’s logical atomism (Linsky 2003: 372, 2014: §1).
2. Both Landini (2007: §2.1, 2011: 162–163) and Maclean (2014: Chap. 8) criticize the dominant interpretation of logical atomism.
3. Galaugher (2013: Chaps. 1–2) provides a critical historical context for Russell’s rejection of the doctrine of internal relations.
4. “We will give the name ‘a *complex*’ to any such object as ‘*a* in the relation *R* to *b*’ or ‘*a* having the quality *q*’ or ‘*a* and *b* and *c* standing in the relation *S*.’ Broadly speaking, a *complex* is anything which occurs in the universe and is not simple” (*PM*₂: 47).
5. “When I speak of a ‘fact,’ I do not mean one of the simple things of the world; I mean that a certain thing has a certain quality, or that certain things have a certain relation” (*OKEW*: 51).
6. A fact need not make a statement true. Arguably, there would still be logical facts even if there were no truths. This does not change that facts are the sort of thing that could make something true.
7. “The fact itself is objective, and independent of our thought or opinion about it; but the assertion is something which involves thought, and may be either true or false” (*OKEW*: 52).
8. “Thus atomic facts are what determine whether atomic propositions are to be asserted or denied” (*OKEW*: 52).
9. “Now a fact, in this sense, is never simple, but always has two or more constituents” (*OKEW*: 51).
10. “Atomic propositions, although, like facts, they may have any one of an infinite number of forms, are only one kind of propositions. All other kinds are more complicated” (*OKEW*: 51).
11. His examples in 1914 are *this is red*, *this is before that*, *Napoleon was ambitious*, *Napoleon married Josephine*, *A is jealous of B on account of C*, *Charles I was executed*, and *Socrates is a man* (*OKEW*: 51, 53, 57).
12. “The constituents of facts, in the sense in which we are using the word ‘fact,’ are not other facts, but things and qualities or relations” (*OKEW*: 51). The sense of “fact” here is specifically atomic facts.
13. I once thought that Russell flatly posited them in his 1918 lectures. Perović (this volume) has shown that the issue is more complicated than I had originally supposed. I thank Perović for changing my mind on this point.
14. Now Russell does posit negative facts in his 1919 “On Propositions”: “Thus facts, and forms of facts, have two opposite qualities, positive and

- negative" (*OP*: 280). But negative facts are not endorsed in his 1924 "Logical Atomism", and he argues against them in the 1940s.
15. "Russell sometimes uses 'monadic relation' for quality, and he sometimes uses 'predicate' for quality; he is explicit about this practice" (*PLA*: 177).
 16. "*Particulars* have the purely logical properties of substances, but do not have their metaphysical properties. That is to say, particulars can only be either the subjects of predicates or the terms of relations" (*AR*: 135).
 17. "It remains to be investigated what particulars you actually can find in the world, if any. The whole question of what particulars you actually find in the world is a purely empirical one which does not interest the logician as such" (*PLA*: 177).
 18. "From the logical point of view, any simple existence is independent of any other, and the only dependence is that of the complex on the simple" (*AR*: 135).
 19. In the passage quoted, Russell actually uses the word 'simple'. A *simple* in Russell's logical sense is what has no parts. Note that a simple need not be concrete. Now Russell's sense-data are given as examples of logical atoms, despite having parts. So we can distinguish logical simples from *logical atoms*, which are taken to be simple relative to a given logical construction and are accordingly picked out by, as Russell says, "a simple symbol". For Russell allows that we might analyze them further at a later stage, and yet that we can pick them out by simple symbols in a given logical construction. So logical atoms are not simple in an absolute, construction-independent sense as simples, if there are any, are. The distinction between logical atoms and simples is not critical to my argument here, but it is a vital one to understanding Russell's meaning.
 20. "It is analytic, because it claims that the existence of the complex depends on the existence of the simple, and not vice versa, and that the constituent of a complex, taken as a constituent, is absolutely identical with itself as it is when we do not consider its relations. This philosophy is therefore an atomic philosophy" (*AR*: 133).
 21. "The only way, so far as I know, in which one thing can be *logically* dependent upon another is when the other is *part* of the one" (*OKEW*: 74).
 22. "**Woodrow Wyatt**: What kind of philosopher would you say you are? **Russell**: Well, the only label I've ever given myself is logical atomist, but I'm not very keen on the label. I've rather avoided labels. **Wyatt**: What does that mean? A logical atomist. **Russell**: It means, in my mind, that the way to get at the nature of any subject matter you're looking at is analysis—and that you can analyze until you get to things that can't be analyzed any further and those would be logical atoms. I call them logical atoms because they're not little bits of matter. They're the ideas, so to speak, ideas out of which a thing is built up" (Wyatt 1960: 15). This forty-second

- interview segment is viewable on the Internet Archive at the 5:55-6:35 mark: <https://archive.org/details/BertrandRussellDiscussesPhilosophy>.
23. "... particulars which are known are called *sense-data*" (*AR*: 135).
 24. "Logically a sense-datum is an object, a particular of which the subject is aware. It does not contain the subject as a part, as for example beliefs and volitions do. The existence of the sense-datum is therefore not logically dependent upon that of the subject ..." (*RSDP*: 9).
 25. "You will note that this philosophy is the philosophy of logical atomism. Every simple entity is an atom. One must not suppose that atoms need persist in time, or that they need occupy space: these atoms are purely logical" (*AR*: 135).
 26. I cite *Problems* because Russell's descriptions there are far more detailed than his description in the logical atomism lectures. Russell abandoned acquaintance relations by 1919 (*OP*: 294–295; *LA*: 167).
 27. "When I speak of a cognitive relation here, I do not mean the sort of relation which constitutes judgment, but the sort which constitutes presentation. In fact, I think the relation of subject and object which I call acquaintance is simply the converse of the relation of object and subject which constitutes presentation" (*KAKD*: 148).
 28. "All cognitive relations—attention, sensation, memory, imagination, believing, disbelieving, etc.—presuppose acquaintance" (*CPBR* 7: 5).
 29. "In a philosophy of logical atomism one might suppose that the first thing to do would be to discover the kinds of atoms out of which logical structures are composed. But I do not think that is quite the first thing; it is one of the early things, but not quite the first" (*PLA*: 169). "I have been speaking hitherto of what it is *not* necessary to assume as part of the ultimate constituents of the world. But logical constructions, like all other constructions, require materials, and it is time to turn to the positive question, as to what these materials are to be" (*LA*: 169).
 30. "Russellian analyses proceed by way of definitions, terminate with indefinables, and, at that point, base themselves on acquaintance" (Pears 1985: 9).
 31. "The fundamental principle in the analysis of propositions containing descriptions is this: *Every proposition which we can understand must be composed wholly of constituents with which we are acquainted*" (*PoP*: 91).
 32. Paul J. Hager's analysis diagrams are useful in grasping the options here; Hager's foundationalist diagram captures the dominant interpretation's notion of Russellian analysis (Hager 1994: 48, Fig. 4.3).
 33. "The theoretical reason for postulating simple particulars is that, when a complex singular expression is fully analyzed, there must be one or more particulars to carry the qualities and relations mentioned in its analysis, and these particulars will be simple because all qualities and relations will have been stripped from them" (Pears 1972: 37).

34. "That is to say, each particular that there is in the world does not in any way logically depend upon any other particulars. Each one might happen to be the whole universe; it is a merely empirical fact that this is not the case. There is no reason why you should not have a universe consisting of one particular and nothing else. That is a peculiarity of particulars" (*PLA*: 179, see also 181).
35. "The acquaintance with the simpler is presupposed in the understanding of the more complex, but the logic that I should wish to combat maintains that in order thoroughly to know any one thing, you must know all its relations and all its qualities, all the propositions in fact in which that thing is mentioned; and you deduce from that that the world is an interdependent whole. It is on a basis of that sort that the logic of monism develops" (*PLA*: 181).
36. "In the same way, in order to understand a name for a particular, the only thing necessary is to be acquainted with that particular. When you are acquainted with that particular, you have a full, adequate, and complete understanding of the name, and no further information is required. No further information as to the facts that are true of that particular would enable you to have a fuller understanding of the meaning of the name" (*PLA*: 179).
37. "This characteristic, that you can understand a proposition through the understanding of its component words, is absent from the component words when those words express something simple. Take the word 'red', for example ... You cannot understand the meaning of the word 'red' except through seeing red things" (*PLA*: 173).
38. "Russell used the empirical argument and claimed, in the spirit of Hume, that, when we find that we cannot push the analysis of words any further, we can plant a flag recording the discovery of genuine logical atoms" (Pears 1985: 5).
39. Confer (Jager 1972: §6.14; Sainsbury 1979: §II.3; Pears 1985: 3–4; Hager 1994: Chap. 4; Linsky 2003: 384–386; Bostock 2012: §14.1). Russell's response to a question from H. Wildon Carr at the end of Lecture II indicates Russell is open to analysis having no end (*PLA*: 180). Likewise Russell's 1924 essay "Logical Atomism" allows for the same (*LA*: 173–174). In both cases, Russell notes that that his considered view is that complexes are composed of simples, and that positing simples is inessential to logical atomism.
40. Russell broke with Neo-Hegelian philosophy in mid-1898 (Griffin 1991: 181). Perhaps Russell means to date his firm adoption of logical atomism to the 1899 publication of Moore's "The Nature of Judgment" in *Mind*. More likely, as we see below he means to include his subsequent adoption of the doctrine of external relations and of Peano's logic.
41. So far as we know Russell coined the phrase "logical atomism" in his 1911 "Analytic Realism", which first appeared in English in 1992 (*AR*: 135).

So strictly speaking, as the article was originally published in French, he first used the phrase “atomisme logique” (*AR*: 412).

42. The other conjunct relates to his rejecting the doctrine of internal relations: “Moreover, by the rejection of à priori constructions the way is opened for philosophy to become inductive, and to begin the patient cooperative accumulation of results by which the triumphs of science have been achieved” (*BoR*: 131). Klement concisely details the importance of this rejection (Klement 2016: §2.1). The importance of this is also missed by reading logical atomism as the search for acquaintance-complexes, so a parallel criticism could be made that the traditional interpretation misses the importance of external relations for Russell’s logical atomism. I ignore that here due to space constraints and focus narrowly on the importance of logic.
43. He retitled the essay “Mathematics and the Metaphysicians” in a 1917 reprinting: “The essay ‘Mathematics and the Metaphysicians’ was written in 1901, and appeared in an American magazine, *The International Monthly*, under the title ‘Recent Work in Philosophy of Mathematics’” (*MaL*: v). Another 1901 essay covering similar ground, “Recent Italian Work on the Foundations of Mathematics”, remained unpublished until 1993 (*RIWFM*: 350–351).
44. Cantor and Dedekind did not mean *concrete* part. Cantor and Dedekind used the idea of bijections (one-to-one correspondences). Using this idea, we can say a collection is *infinite* means there exists a bijection from itself to a proper sub-collection of itself.
45. Russell, at least by 1914, denied that ethics belonged to scientific philosophy: “Human ethical notions, as Chuang Tzu perceived, are essentially anthropocentric, and involve, when used in metaphysics, an attempt, however veiled, to legislate for the universe on the basis of the present desires of men. In this way they interfere with that receptivity to fact which is the essence of the scientific attitude towards the world” (*SMP*: 63). Russell admits, “the importance or value, within its own sphere”, of ethically inspired philosophy, he concludes, “The scientific philosophy, therefore, which only aims at understanding the world and not directly at any other improvement of human life, cannot take account of ethical notions without being turned aside from that submission to fact which is the essence of the scientific temper” (*SMP*: 64). Thus he held that ethical philosophy is disjoint from logical atomist philosophy. Here I leave open the consistency of ethical philosophy with logical atomist philosophy, and so of logical atomist ethics.
46. In this work, Russell affirms logical atomism: “The philosophy which I wish to advocate may be called logical atomism or absolute pluralism ...” (*SMP*: 65).

47. Confer also his 1904 review of Moore's *Principia Ethica*: "... philosophy will never advance, until the notion is dispelled, that sweeping general principles can excuse the patient attention to detail which, here as elsewhere, can alone lead to the discovery of truth" (*TMG*: 575).
48. Russell earlier states, "... I call the philosophy which I advocate 'logical atomism'" (*OoP*: 259).
49. I think Russell is referring to his logical atomist philosophy here. He has just illustrated on the previous page "the utility of philosophical syntax" using his theory of definite descriptions (*HWP*: 859).
50. Pears held that Wittgenstein did just that in reasoning a priori for positing simples (Pears 1985: 5–6).
51. Urmson, for instance, says "this new, rich logic" merely "suggested" logical atomism (Urmson 1956: 7).
52. Russell goes even further in his 1914 *Our Knowledge*: "Logic, we may say, consists of two parts. The first part investigates what propositions are and what forms they may have; this part enumerates the different kinds of atomic propositions, of molecular propositions, of general propositions, and so on. The second part consists of certain supremely general propositions, which assert the truth of all propositions of certain forms. This second part merges into pure mathematics, whose propositions all turn out, on analysis, to be such general formal truths. The first part, which merely enumerates forms, is the more difficult, and philosophically the more important; and it is the recent progress in this first part, more than anything else, that has rendered a truly scientific discussion of many philosophical problems possible" (*OKEW*: 57–58; see also *SMP*: 65–66).
53. Here I am taking inspiration from the tree readers of the *Tractatus* (Bazzocchi 2014: IV–VII).
54. "There are a great many different kinds of facts, and we shall be concerned in later lectures with a certain amount of classification of facts" (*PLA*: 164).
55. "I propose to begin today the analysis of facts and propositions, for in a way the chief thesis that I have to maintain is the legitimacy of analysis ..." (*PLA*: 169).
56. "I do not see any reason to suppose that there is a complexity in the facts corresponding to these molecular propositions ..." (*PLA*: 187).
57. "Today we have to deal with a new form of fact ... Now I want to point out today that the facts that occur when one believes or wishes or wills have a different logical form from the atomic facts containing a single verb which I dealt with in my second lecture" (*PLA*: 191).
58. "We have such propositions as 'All men are mortal' and 'Some men are Greeks.' But you have not only such *propositions*; you also have such *facts*, and that, of course, is where you get back to the inventory of the world: that, in addition to particular facts ... there are also general facts and existence-facts ..." (*PLA*: 206).

59. "I am proposing to deal this time with the subject of descriptions, and what I call 'incomplete symbols', and the existence of described individuals" (*PLA*: 211).
60. "I come now to the proper subject of my lecture, but shall have to deal with it rather hastily. It was to explain the theory of types and the definition of classes" (*PLA*: 226).
61. In a 21 May 1918 letter, Russell writes, "*To P. Jourdain ... Is he going to print 2 of my logic lectures in July and 2 each subsequent quarter? I hope so*" (Griffin 2001: #313). Jourdain was then editor of *The Monist*, where the logical atomism lectures were published.
62. Thanks to the Bertrand Russell Archives in the William Ready Division of Research Collections, McMaster University Library, for permission to use this photograph.
63. In a 17 April 1918 letter, Russell writes, "I wish to write two works concurrently, one to be called 'Introduction to Modern Logic' or some such title, more or less on the lines of the lectures I gave you before and after Christmas ..." (Thompson 1975: 18).
64. A case in point is Russell's casual suggestion that there may not be logical simples (*PLA*: 180). Pears explains this away as Russell's being confused (Pears 1985: 4). Pears thus squares what Russell actually believed with the text. But more to the point is that this interpretation poorly fits the text: for if logical atomism is crucially committed to an ontology with logical simples (knowable by acquaintance), Russell is either unaware of this fact or far too casual in entertaining an ontology without logical simples.
65. "I hold that logic is what is fundamental in philosophy, and that schools should be characterized rather by their logic than by their metaphysic" (*LA*: 162).

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