The Problem of Complex Facts

In his lectures on logical atomism, Russel argues that there is a fundamental and simplest level of reality, to which all other aspects of reality can be reduced to. The fundamental object of Russel's ontology is the atomic fact, a fact which is not built upon others, and expresses a relation between a collection of particulars. The particulars appearing in atomic facts are irreducible things which cannot be described in terms of other things, but rather are the fundamental building blocks of all things. These particulars are then also the constituents of atomic facts, which are then the building blocks of all true propositions. In this paper I will argue that Russel's particulars don't exist, and that their nonexistence undermines logical atomism. I will further argue that the molecular nature of facts weakens the existence of facts altogether.

Russel never was quite clear on what a particular is, but did suggest some general notion. Russel views the particulars as simple things, contrasted with complex things. Most things we think about, Russel tells us, are in fact complex. Ordinary objects like tables and chairs are constructed of many simpler parts, and are not in themselves simple. That is to say, a table isn't simple because we can describe it in terms of things which are more fundamental. A table is made up of legs and a flat surface, so that the table itself is not the most basic unit in our analysis of table. The kind of notion Russel wants of these simples is that our knowledge of it relies on nothing besides our acquaintance with the simple thing in question. In particular, an understanding of a simple thing should not be possible without this acquaintance, so

that knowledge of a simple thing is not captured in terms of other things which are not it.

The first thing to consider in wondering whether there are in fact simples is Russel's argument for simples. Here there are two arguments. The first is that to be complex is to be made up of parts, and these parts are simple. The second is that the process of reducing a complex thing to its parts will terminate, and the point at which it terminates will be the simples. But neither of this arguments are very convincing at all, at best they argue that the more natural and intuitive interpretation of the existence of complexity is given by presupposing simples, but a perfectly coherent account can be given without this assumption. That is, it can be that complex things have parts which are themselves also complex, and that the process of reducing a complex thing to its parts is one which continues *ad infinitum*. Russel himself admitted as much, so that we don't have an argument for believing in the existence of simples. In fact, it seems that on the face of it both views, that complex things are composed of other complex things and that complex things are composed of simple parts are equally tenable, so that the question is only in the fact of the matter.

We now consider some candidate simples, and find that they are in fact complex. The first thing to consider is sense data. Here Russel himself does not believe that these are necessarily simple, but that shouldn't stop us from considering it all on our own. We had that what makes something simple is that it is known by acquaintance, and sense data certainly is that way. The question is then whether our perception of sense data relies fundamentally on our acquaintance or can it be given

in terms of something else. Here we are considering not the notion of sense data, but a certain specific sense datum. It is certainly the case that the visual sense datum of a table is constituted by the visual datum of its parts. So what is apprehended by the image of a table can be known by seeing its disassembled parts and reading the instructions for constructing a table. I should then say that the seen table is composed of the seeing of its parts. Even though I'm focusing here on visual data, the argumentation for other sense stimuli will be similar. As I carry out this reduction, viewing seen things as collections of smaller seen things, I find that this process doesn't strictly terminate. By this I mean that I cannot directly see an atom or molecule, so that at some point the parts of the sense datum are no longer sense datum themselves, yet if I can see something I can remove an atom and still see it. The sort of vagueness in sense datum leads me to deny that there is a smallest unit of seen thing, so that every part of what is seen is composed of even smaller seen things.

The sort of complex reduction I have considered above is somewhat suspicious however. I argued that if I removed an atom from a seen thing I would still see it, but this suffers from the issue that the atom I removed is itself not seen. So that the above decomposition is not of a complex visual stimulus into two simpler visual stimuli. Our account of these simples then states that these simple things are the sense data produced by physical objects that if physically divided would fail to produce multiple sense data parts which together compose to build the original sense data. However, a worry then is that these simples are just particles of a particular color, which are not the kind of simple things we are seeking. Although we may find ourselves forced take the concept of color or the notion of a particle to be simple, once these notions are

known and understood to us, the sense data of a small visual stimulus needn't be experienced in order to describe it, but rather it can be reduced to the notion of a colored particle. Therefore, there are no simple pieces of visual sense data, for everything sensible reduces further.

We can wonder still about whether sense data are simple, since sensible objects appear to us as coherent wholes. To recall my earlier decomposition of the visual sense data of a table, I said that a table has the visual data of its parts, as well as the information about how these are combined. I then went on to show that its parts have parts themselves, but what of the way in which the parts are combined? It might be thought that the fact that these parts form a coherent whole is simple. But this is easy to refute, by understand first that there are many parts, so that if something is simple it is the combination of just two parts. Here too, the sense data of two things combined as one is hardly simple, and can easily be reduced by describing the exact way in which they're combined.

A more convincing case for the simplicity of sense data could be made by appeal to the experience of the perception of a visual object. Here the idea is that in perceiving a table there is a perceptual event which is not composed of proper parts. The table appears to us as a single object, and not as a collection of objects combined. One issue with this account is that it's not particularly clear how this is supposed to work. Another problem is that this doesn't seem to seriously admit the possibility of complex things, which Russel claims most things actually are. Most importantly however is that there is not an actual unit of experience to point to. We can say that

the perceptual apprehension of a table has got smaller perceptual parts from which it is constructed. Thus the event of having a perceptual experience doesn't manage to put the notion of simples on any more solid footing.

Russel advocates for thinking that colors are simple, but this too doesn't seem to be the case. Russel argues in particular that the name "red" indicates something which the description "the color with the greatest wavelength" does not. "Red" communicates about what red is like, while "the color with the greatest wavelength" says nothing about what in fact red is. So that this knowledge about red, which manages to pick it out, is not what the red is. While that's an interesting point, we can still say things like green is the combination of yellow and blue. In the case of red the right way to go would probably be saying that red is a darker sort of orange, but more like pink than like brown. That is to say that the colors are related to each other, and can be defined in terms of one another, so that we get a circular reduction of the complex to the complex. Even white and black are the combinations in equal parts of all colors and the absence of any color respectively. There also certainly would be no reason to assert that a particular color is the simple one. So since every color can be described without ever having experienced it, as long as the listener is familiar with all the other colors, it turns out that red is not the kind of thing which is only known by acquaintance, for it can be known without ever having encountered it.

Another place to look for truly simple particulars would be in the fundamental particles of physics. Here we find that these aren't particulars for a quite a few reasons. In the first place, our acquaintance with these particles as individuated entities isn't

direct at all, and relies heavily on the macroscopic. Any electron or quark which we then reference will actually just be shorthand for a long description, probably starting with some bit of data on a computer screen, understood within the context of the software running on the machine and the hardware feeding inputs to that software, and then to how that hardware is detecting whatever particle in question. Even at this level our observations are indirect, it is not that we can detect a quark, but rather there is some pattern in the data which seems to be due to some property of the quark. It would seem strange indeed to call such an entity a simple particular. If we however consider particles to be collections of properties, which indeed seems like the case, then these properties will be the parts of the particular. So we would say that an electron is an object with such a spin and this mass and that electric charge, but then we have just in doing so reduced the electron to things which are not it, so that it is clearly complex. In fact, at this point we notice that our knowledge of electrons is entirely through description, and not at all through acquaintance.

One last place to look for simples is in things like those conceptions of science that are general notions. Here we mean something like life, motion, force and temperature. The first thing to do is to distinguish between the thing itself and its mode of apprehension. That is to say, in the case of temperature, there is the experience of temperature, and the fact of it which is known through experience. For feeling hot or cold is a psychological phenomenon, and temperature is a physical phenomenon. So too with motion. There is the experience of motion, like that which makes you feel dizzy, which should be distinguished from the fact of motion, which is velocity relative to an observer. The phenomena in themselves can hardly be simple, as they could be

reduced to descriptions of what they're like. Heat can be reduced to the motion of particles, life to reproductive behavior, motion can be described in terms of position and time, time can be expressed in terms of information and entropy, information can be described in terms of a system's states, and so on. In general, a notion which can be studied with science is one that can be measured in something material, so that the notion can be described in terms of its presentation in such a material thing. The psychological phenomenon too could be described in terms of its effect, although this is less straightforward. Motion might be rapid change in orientation, cold is a sort of sharp then numbing feeling. It's not particularly easy to do this kind of reduction, but there seems no strict reason that these should in fact be simples, when nothing else turned out to be.

We conclude then that there are no simples, which leads us to think that there are no atomic facts. On Russel's account, an atomic fact is one which expresses a relation between simple particulars. It is obvious then that the nonexistence of simple particulars immediately prevents this definition from ever obtaining. But we can still dig deeper, and see whether in fact there turns out to be a sort of thing which plays the sort of role which Russel would like atomic facts to. Note however, that even if there are some simples, this doesn't suffice to give the complete sort of account for facts Russel is aiming at, because we would only have some limited set of facts which are atomic: those concerning these odd particulars which in fact manage to be simple.

Atomic facts for Russel are the building blocks of true propositions. They are the facts such that all true things are built out of them, such that any true sentence is

true in virtue of some facts, and similarly a false sentence will be false in virtue of some facts. Fundamental to the notion of atomic fact is that atomic facts are the most basic of facts, and each is independent of all the others. However, if there are only complex particulars, it should turn out that all facts are molecular.

Let us see why the decomposition of particulars leads to decomposition of facts regarding those particulars. Take for example a simple fact such that "x is to the right of y". Since x and y are particulars, they are complex, and are composed of parts x_1, x_2 and y_1, y_2 respectively. We can then reduce the fact expressing a relation between x and y to relations between their parts, saying "x_1 is to the right of y_1 and x_1 is to the right of y_2 and…" so that this fact turns out not to be atomic, in the sense that it isn't the most basic of facts, but rather is the conjunction of some other facts.

Russel might rejoinder however, saying that even though there are no simples, which allows the decomposition of atomic facts, we still ought to call facts which can be expressed atomically atomic. Such a defense would state that just having an equivalence of an atomic fact with a molecular compound of facts needn't ruin the notion of atomic fact, for we can restore the atomic fact by saying that it is such a fact which can be expressed atomically. However, it is difficult to see what cannot be an atomic fact under such a revision. Given some conjunction of facts "aRb & cQd" we can create the compound particulars *ac* and *bd* satisfying predicate RQ, and re-express this fact as if it were atomic as "acRQbd". Since our particulars needn't be simples, every true proposition should be atomically expressible in this manner. It then turns out that the lack of simples blurs the line between the atomic and molecular

in a fatal way, and we find that the entire notion of atomic proposition is founded upon the notion of irreducible particular in a completely nontrivial way. So, given that we do not accept these simples, the only available notion of atomic fact is the above modified definition. Which turns out to simply end up being all true propositions, since anything can be a particular in a world without simples. In which case we may as well adopt the notion that any true proposition has a corresponding atomic fact. Where the fact is that which makes the proposition true.

On Russel's view, the existence of molecular facts is not at all given, while the existence of atomic facts is. That is, Russel does not say that there is a fact corresponding to "*p* or *q*" but rather that there is a fact corresponding to *p* and another to *q* and the truth of "*p* or *q*" relies on these facts, but not that there is an additional fact for the disjunction of two facts. However, Russel's denial of molecular facts relies on Russel's thinking that there are indeed facts which are atomic. In a world with atomic facts, Russel needn't bother with molecular facts, and can rely on atomic facts to do the truthmaking for molecular propositions. In light of our objections, where no facts turn out to be atomic, Russel might react by extending the sort of existence afforded to atomic facts to molecular facts instead.

I guess then what could be said against allowing molecular facts is simply that it would seem quite odd. You would end up taking the position that there is some entity which grants the truth of "the pope is in the Vatican and my quarter is in my pocket", when this doesn't really seem to manage to describe any sort of coherent whole. Facts would abound, and they would consist of everything true, with no real further

restriction. While this remains tenable, it doesn't seem like the sort of entity you wanted to point to when you set out to describe what it is that makes true propositions true.

Once we notice that we are admitting arbitrary constructed facts, we start to examine more closely what one wants and expects facts to behave like. Doing so, we find that molecular facts are not quite the sorts of things that one originally wanted. It turns out that if facts are molecular we do better by simply accepting that there aren't any entities to call facts. Because if we allow these facts, we run into a host of issues.

One important issue that arises is that we've lost the independence of facts. In a passage of *Tractatus*, Wittgenstein tells us that "Each item can be the case or not the case while everything else remains the same." (1.2.1) We know that Russel's own views are similar to this, and it's the sort of picture Russel is trying to paint with atomic facts. A logical atomist would like the atomic facts to be some sort of orthogonal basis for reality, the collection of atomic facts provides a set of independent truthmakers combinations of which are the truthmakers of any other true statement not in this set. While the collection of all facts suffices to provide a truthmaker for any predicate, it gives us a dependent set. We cannot then reduce the failure of a predicate to obtain to a specific and contained subcollection of its atomic elements. Here we should note that in fact Russel doesn't think atomic facts make up all the building block truthmakers, but does indeed admit some general facts. In particular Russel introduces the fact proclaiming all the chronicled facts to be the totality of facts, which is not something that arises as a relation between particulars. Nevertheless, the more

or less independence of factual building blocks is a nice feature which one would want of facts. In particular independence coheres well with the notion of facts being the additional data on top of particulars which taken together with particulars yields all of what there is. Essentially, with independence you can think of facts as simply a description of the manner in which particulars are arranged. Under the picture of allowing every true proposition to have a truthmaking fact for it however, facts become all possible descriptions of the ways in which particulars are arranged. This introduces more into all that there is than all the things that could be encountered, but rather adds the ways in which they can be described. Which is essentially a matter of perspective, since every fact will end up coinciding with a whole bunch of other facts, such that a single fact cannot be altered without altering many others, and so the distinction between co-occuring facts turns out to be insubstantial. It is harder then to allow facts into the collection of things that are, since they have now become less about a state of affairs and more about a perspective concerning a state of affairs.

My concern here is that in admitting facts without atomic particulars we find ourselves admitting multiple facts as performing an identical function. The truth maker for "Caesar conquered Gaul" in one frame of reference is the relation conquered between the particulars Caesar and Gaul, and in other frames of reference an entirely different construction. We can for example reduce Caesar to our experience of Caesar, which is comprised of the stories about Caesar through which we know Caesar. We can also reduce the act of conquering to a series of battles, and in doing so we will also divide Gaul into a collection of territories. We can also keep viewing Caesar simply as a figure in the past, but subdivide Caesar's body into distinct parts.

Here we see multiple different constructions which are the truthmakes of a single naïve predicate. So here we have multiple factual constructions which are made to say the same thing. If facts turn out to be ways of describing things, and every true proposition gives rise to a fact, what is the difference between facts and true propositions? Do we need to introduce a new entity to grant a true proposition its truth? More pressingly, can we safely think of such an entity as being a part of the world rather than an object of thought?

Another important issue is the asymmetry between facts and the sentences expressing them. Even though no facts are simple, many sentences are. When a proposition is expressed, it will be in the form of a series of relations between particulars interspersed with logical connectives. In the realm of propositions, a sentence expresses an atomic proposition if it consists of a simple relation, and expresses a molecular proposition if it makes use of logical connectives. In this way, there are atomic propositions, although these may be logically equivalent to some molecular proposition. That is, a given sentence expresses a proposition either as atomic or as molecular, so that as far as the expression of propositions is concerned, there is in fact a coherent notion of atomism. We now see that our usual discussion of facts via propositions in ordinary speech ignores the divisibility of facts. Our discussion of facts then does not mirror the facts themselves. This issue already exists under Russel's construction, since a sentence expressing as atomic a relation between complex particulars turns out to be in reality expressing a molecular proposition. In that case however, we could chalk up the disconnect between language and logic to imprecision of ordinary language or useful shorthand. In our case however, we find

sentences capable of something that the facts they attempt to capture are not, namely being atomic. It seems that we can only get a handle on facts by treating them as if they were potentially atomic, so that the facts we try to refer to and the facts that are differ fundamentally.

Another point of concern is that it might be said in that whether a fact in question is complex turns on a matter of choice. If we view its constituent particulars as simple, we can state a fact as if it was atomic. In this sense which facts we take as primitive is an arbitrary feature of context, and there will be a different molecular fact expressing the same logical content. So a fact is only ever atomic when we've set our sights on its relata as the starting point of our analysis, not to be broken down further. This introduces an open-endedness to facts, which is precisely that sort of thing facts are meant to do away with. These "facts" which we look to in attempt to transcend context-dependent ambiguity are context dependent as well.

It doesn't seem necessary however for us to allow even this extent of atomic fact. It is better simply to say that all facts are indeed complex, though some facts can be spoken of as if they were atomic. The fact is the truthmaker for a proposition, but it is also a truthmaker for conjunctions of subpropositions, thus revealing it to have always been molecular. I suppose it's possible to say that there are multiple facts expressing the same set of relations but expressed in terms of a different breakdown of the relevant particulars, but it's more reasonable just to proclaim a single fact which is the truthmaker for a variety of sentences which express the same proposition. It

seems then that the question of whether a fact is atomic is meaningless, essentially because all facts are molecular.

This discussion itself lends an argument against molecular facts. We find ourselves asking whether separate presentations of what is ultimately the same truthmaker are to be considered the same or different facts. This question wouldn't arise under an atomic theory of facts. Although this isn't a very difficult question to settle, and it's fairly clear that we won't consider facts distinct simply because of their presentations, we can see in this discussion how facts have become embroiled in imprecision. A more naïve notion has us thinking that a fact is just what it is, but now a fact is found in all the sentences which it settles. We have a single fact for a collection of sentences.

Let us see now the logic of the truthmaking process in the presence of complex facts. Russel certainly thinks that sentences can expresses molecular propositions, but would like to think of the corresponding facts as logical constructions consisting of atomic facts. In the world of complex facts however, we have no serious reason not to admit a new fact for every true proposition. In the same way that any typical fact is composite, a composite fact can be constructed to relate directly to any particular proposition. We come now to an unexpected result. The role of logical construction is then redistributed to be an internal language of facts, and not something which is used in predication. This is an odd feature to find, as logic is typically seen as the grammar of predication, and should have little to do with facts directly. We find then that facts

are not so much things as much as mental constructions, since they are built with logical operations.

Previously, one thing we might have wished from facts is that they be pre-logical. If facts were atomic, we could say that facts make atomic predicates true or false, and it is only for the more complex molecular propositions for which we introduce the machinery of Boolean logic. However, since facts are indeed molecular, we find ourselves immediately embroiled in logical constructions. This throws a wrench into the bootstrapping process which we would have gotten with atomic facts. Instead, there is no simple ground from which things are built up, and the features of the system are built into its parts. Facts in and of themselves demand not only an understanding of other facts, but of the ways in which facts can be related to each other. This issue of immediate complexity paints facts suspiciously like a mental construction without the sort of independent existence Russel was presenting them as having.

Another interesting effect of complex facts is in the realm of definitions. Russel would like us to think of definitions as simply shorthand for molecular statements. But since it turns out that everything is a composite, a defined term turns out to function just like any other name. This isn't much of an objection, and is something we can expect Russel to find quite agreeable. But it's an example of how the absence of simples begins to subtly ripple throughout Russellian ontology. The effects of the complex nature of things is not isolated, and can't be treated with the quick fix of admitting complex facts and leaving everything else untouched.

I think the real issue is simply that we'd like to think of predicates and propositions as being simple self-contained units. However, on the account in which these express relations between particulars, that is following the construction for predicates which we've been following here, this requires that particulars be simple. That is, when propositions express relations between particulars, propositions can be well behaved exactly when particulars can be simple. Perhaps an account which admits that it only holds in a particular frame of reference could escape this reduction. But we cannot have it both ways, we cannot submit our analysis to the test of the fact of the matter about particulars and salvage atomism. The atomism and simplicity comes from our frame of reference, and isn't something that arises from the construction of particulars all on its own. If we indeed want to carry out a process of analysis, we will find no clearly marked stopping point, which should then make us hesitant to rely on facts.

It seems then that the complexity of things undermines our picture of facts, even though it doesn't explicitly contradict facts themselves. In a molecular world we are just as free as in an atomic one to assert a fact-based predicate satisfaction mechanism. We simply want facts to be the entity of the way a thing is, beyond our acquaintance with the thing in itself. That is, once we know of a thing that it is, knowing facts about it tell us further about the properties and relations that it bears. This urge and motivation for there to be a substances comprising the state of a thing seems not at all diminished on ground of the molecular natures of facts and things. Since the motivation is the thought that there is more to all that there is than the things that are, but rather there is the matter of the arrangement and natures of these things as well.

But even though we've maintained our reasons for asserting facts, the facts we find are not of the sort that we wanted, and so the complexity of things urges us to abandon facts.

It is interesting to note that in the presence of complex particulars we may in fact find that the decomposition of things is enough to account for facts. That is, we may hope that a relation R between particulars A and B merely expresses the manner in which the particular AB comprised of both A and B decomposes into the particulars A and B. We might have that A is a table and B is a vase, and the relation R of B sitting on top of A is expressed in the way that AB is a coherent whole. It's clear that if were to adopt this kind of system we would still need more structure, in order to differentiate R from the relation Q which expresses that A is darker than B, for example. Nonetheless, we can hope that some of the relations between particulars can be reduced to the construction of the particulars as complexes. So we find that at the same time that complexity undermines the nature of facts it removes some of the need for them in the first place.