CHAPTER 23

Conceptual content and the structure of the proposition

As we noted, Evans held that there is "non-conceptual" content. Others have disagreed. We've seen some reasons to think that Evans is right. But to arrive at a definitive resolution of this dispute, we must make it maximally explicit what is meant by the term "non-conceptual content."

It is a truism that sentences have meaning. (In this Chapter, "sentence" is to be taken to mean "sentence-token", wherever appropriate.) Further, it is a truism – a matter of terminology – that these meanings are propositions. The question "is there non-conceptual content?" seems to amount to this: "Are there representational entities whose contents are not propositions and are not, in any significant respect, even proposition-like?"

We've already seen that the answer to this question is: "yes." But, in the present author's view, no unexceptionable answer to the question "what are propositions?" has ever been produced. And so long as that question remains unanswered, the opponent of non-conceptual content can take refuge in the obscurity of the notion of propositionality.

I believe that, given some of the points made in the last chapter, we can develop a creditable analysis of what propositions are and, on that basis, can further undermine the credibility of the view that there is no non-conceptual content.

What are propositions? The traditional answers

Let us briefly discuss some of the existing answers to the question "what are propositions?" First, there is Russell's (1903) answer. The proposition meant by "Smith punched Jones" is some kind of a structure that consists of Smith, the relation of punching, and Jones. (Let us set aside the problems relating to the tense-marker.)

The problem with this answer is that, while it may be right, it is excessively vague. We want to know *what* exactly the just-discussed structure is. The most obvious answer to this last question is: "that proposition is the set (Smith, the relation of punching, Jones)."

I do not think that, historically, anyone has given this exact answer. But it is worth considering because the problems with the answers that have been given can be understood in terms of the problems with this answer.

First of all, if the proposition meant by "Smith punched Jones" is the set (Smith, the relation of punching, Jones), then the proposition meant by "Jones punched Smith" must also be that set. In that case, those propositions would be identical. Since they are

not, the proposition meant by "Smith punched Jones" is not that set. In general, the problem with the answer being discussed is that it cannot distinguish between distinct propositions that have the same constituents.

Many (probably most) contemporary authors *do* hold that the proposition meant by "Smith punched Jones" is a set. They deal with the problem just discussed by saying that it is a *structured* set (R. Moore 1995: 101, Cresswell 1985: 446–452, King 1995, 1996, 1997, Perry 2000: 213). So, according to most proponents of this view, *Smith punched Jones* is the ordered pair <<Smith, Jones> the relation of punching>, whereas *Jones punched Smith* is the ordered pair << Jones, Smith> the relation of punching>. In general, propositions are *structured* sets; and distinct propositions that have the same constituencies are different structurings of those constituencies.

There are two problems with this position. The proposition *Smith punched Jones* is true or false. But the set <<Smith, Jones> the relation of punching> is neither true nor false.[1]

This problem is not necessarily insuperable: if we identify some relation R such that <<Smith, Jones> the relation of punching> has R with respect to all and only those worlds where *Smith punched Jones* is true, then we *can* identify <<Smith, Jones> the relation of punching> with that proposition, and we can identify its being true (or false) in a given world w with its bearing (or failing to bear) R to w. (Of course, care must be taken that our choice of R doesn't render this analysis of propositionality trivial or circular.) But advocates of this view have identified no satisfactory value of R (even though, as we will see, some unsatisfactory attempts to do so have been made). Consequently, this analysis of propositionality remains programmatic.

There is another problem. For the sake of argument, suppose that *Smith punched Jones* is in fact identical with some structure consisting of Smith, Jones, and the relation of punching. The structure in question cannot consist of Smith's standing in the relation of punching with respect to Jones. For if the proposition *Smith punched Jones* were identical with a structure of that kind, then the very existence of that proposition would demand its truth. But that proposition obviously *could* be false. So if we identify that proposition with a structure consisting of Smith, Jones, and the relation of punching, we must make sure that it does not consist of Smith's standing in the relation of punching with respect to Jones.

But if the way in which Smith, Jones, and the relation of punching are arranged in *Smith punched Jones* is so different from the way in which those three things would be

1. I recall John Perry making this point. But I haven't been able to find the article where he makes it.

arranged in an instance of Smith's punching Jones, then it becomes unclear why that structure is the right one.[2]

Presumably, the arrangement in question is an abstract, not a physical, one. But that raises the question discussed a moment ago. Given some particular abstract relationship, why is *that* relationship so special? If that abstract relationship has no obvious counterpart in a case of Smith's punching Jones, then why say that *Smith punched Jones* is a structure that involves interrelating Smith, Jones, and punching in *that* particular way? In any case, until we are told exactly what that structure is, the view in question (namely that *Smith punched Jones* is a structure consisting of Smith, Jones, and the relation of punching) is an analysis-schema, not an analysis proper.

It seems that two issues are being muddled by those who identify propositions with structures of this kind. We can represent the structure of the sentence "Smith punched Jones" in different ways; for example, we can use a tree-diagram or we can use an expression like "<<Smith, Jones> the relation of punching>." (Again, we are setting aside niceties relating to the tense-marker.) In fact, linguists often *do* represent sentential-structure in this way.

But this doesn't tell us anything that we didn't already know concerning the structure of that proposition. As many, most famously Wittgenstein (1922), have pointed out, given that sentences express propositions, there must be *some* structural similarity between the sentence and the proposition. But until the exact similarity-relation is identified, we only have an innocuous truism, not an analysis.

This brings us to a related point. The ordered pair <7,5> isn't true or false. Given that ordered pairs (and n-tuples) are not *in general* true or false, why do they suddenly acquire this property when their members are Smith and Jones, as opposed to numbers? Obviously the ordinal properties of <<Smith, Jones> the relation of punching> are meant to indicate *some* kind of structure – some kind of structure *not* had by *Jones punched Smith*. But, as we said a moment ago, given only that *Smith punched Jones* can be coded in that ordered pair, we know nothing that we didn't already know as to the identity of that structure; we know nothing more than we already knew about it, given our pre-existing knowledge that it can be coded in the sentence "Smith punched Jones" or in a tree-diagram of a certain kind.

2. This refutes the Tractarian view that the proposition *Smith punched Jones* is some structure (consisting of Smith, Jones, and the relation of punching) that is isomorphic with the kind of state of affairs that would make that proposition true. If that structure is an isomorph of such a situation, then it would *be* such a situation (unless the word "isomorph" is being used in a strictly metaphorical, and thus completely uninformative, manner). But in that case, the mere existence of the proposition *Smith hit Jones* would pre-determine its truth. Given any contingent proposition P, an analogue of the argument just given shows that, if the Tractarian view is correct, P's existence demands its truth. Since some contingent propositions are false, so is the Tractarian view.

Frege's view

Frege's (1891, 1892) view regarding the proposition *Smith punched Jones* is that it is a structure of some kind or other. (He said very little as to what exactly that structure would be.) But Frege denied that it is Smith and Jones *per se* that are constituents of that structure, holding instead that it is concepts of Smith and Jones that are such constituents. As we discussed in earlier chapters, Frege held that "Smith" and "Jones" have *senses* for their semantic contents, where a "sense" of an expression denoting x is a concept that x uniquely satisfies. Thus, in Frege's view, it is these senses, and not Smith and Jones *per se*, that are constituents of the proposition meant by "Smith punched Jones", i.e. of the proposition *Smith punched Jones*.

In Chapter 3, we saw why, if the semantic content of "Smith" is a concept, then the proposition meant by "Smith punches Jones" becomes an existence-claim, as opposed to the atomic proposition that it obviously is. This is not to mention that, given Kripke's (1972) points, it isn't really an option to say that the semantic content of "Smith" is a concept. From this viewpoint, Frege's view is a step backwards from the view that *Smith punches Jones* is an ordered n-tuple of the kind just discussed.

Frege made a point that could be interpreted as being an attempt at a partial answer to the question "what is the proposition *Smith punched Jones*?" Frege said (correctly, no doubt) that this proposition has as a constituent the concept *x punched y*. In his view, the proposition *Smith punched Jones* is what results when the variables (or empty-spaces) are "saturated" with Smith and Jones (or, rather, with the corresponding concepts).

There are two problems here. First, as Davidson (1967) said, until we are told what "saturated" means, Frege has given us only a worthless metaphor, given that the word "saturate" is obviously being used metaphorically in this context. Frege has told us that a proposition is what results when that concept is completed in some way or other by (senses of) Smith and Jones. But he hasn't told us what the nature of that completion is. And until we know that, we don't know anything that we didn't already know.

There is another problem. What is the concept *x punched y*? Sometimes Frege answers this by saying that it is what is had in common by all and only *Smith punched Jones*, *Mary punched Fred*, *Larry punched Harry*, and so on. So concepts are abstract features of propositions; they are what different propositions have in common.

But, in that in case, propositions cannot be *composed* of concepts. (There is, of course, an obvious parallelism between this point and the point we made earlier concerning the constituencies, or lack thereof, of concrete situations Given that property-instances are what situations have in common (or, more accurately, are to be understood in terms of what situations have in common), situations cannot be composed of such instances.) So if we see *Smith punched Jones* as having the concept of punching as a constituent, then we cannot see that concept as being abstracted out of propositions.

In general, the constituents of propositions cannot themselves be understood *in terms of* propositions. We cannot say that Smith (or redness or pain or...) is what is had

in common by all and only those propositions that (in English) are expressed by sentences of the form ⌜...Smith...⌝ (or ⌜...red...⌝ or ⌜...pain...⌝ or...).

In its turn, this fact gives us yet another reason to hold that the contents of our mental states are ultimately *not* proposition-like and are therefore not sentential. To grasp *Smith punched Jones*, I must grasp its constituents. Trivially, I grasp those constituents by way of mental states whose contents are propositions or by way of mental states whose contents are not propositions. In the latter case, there is non-propositional content.

In the former case, we have a vicious regress. Grasping a proposition involves grasping its constituents, and grasping any one of its constituents involves grasping one or more other propositions. Given the reasonable supposition that no proposition can be a proper constituent of itself, it follows that one must grasp infinitely many propositions to grasp a single one. But it is implausible, and (I believe) incoherent, to suppose that one's grasping *Smith punched Jones* involves one's grasping infinitely propositions.

Also, given that one cannot grasp a proposition without grasping its constituents, it is viciously circular to suppose that mental representations categorically have propositions for their contents. It must therefore be assumed that, ultimately, the contents of our mental representations of propositional constituents are non-propositional. (Of course, the contents of such representations are *sometimes* propositional, given that some propositions have other propositions as constituents. Hence the word "ultimately" in the second to last sentence.) We have seen that there is independent support for this position.

Propositions as the sets of their logical consequences

According to Carnap (1937) and Clarence Lewis (1946), a proposition *is* the class of its logical consequences. This thesis is often expressed in terms of sentences: "the content of a sentence is the class of its analytic [or logical] consequences." [3]

There are some serious problems with this view. First of all, the statement "propositions are classes that contain their logical consequences" is viciously circular. Given the reasonable supposition that those consequences are *themselves* propositions, the position in question amounts to the circular claim that a proposition is the set of propositions that follows from it.

3. Carnap (1937: 42) writes: "by the logical content of [a sentence]...we understand the class of non-analytic consequences of [that sentence]."

Clarence Lewis (1946: 55) writes: "The *intension* of a proposition comprises whatever the proposition entails: and it includes nothing else" (quoted in Bonjour 1998: 40).

This view is not an anachronism. Brandom (1998: 96) holds it, and it also underlies the contemporary view that propositions are sets of worlds (or, equivalently, functions from worlds to truth-values).

One way to block this vicious circularity would be to say that the consequences of a proposition are *not* propositions. Whatever merits this position has, it is obviously not available to someone who denies that there is any fundamental difference between propositional and non-propositional content.

There is another problem with the view that a proposition is the set of its own consequences. Presumably the proposition *Smith punched Jones* has one constituent corresponding to Smith, one corresponding to Jones, and one corresponding to the relation of punching. (This is not to deny that it has other constituents. But it presumably has *at least* those three.) A related point is that the sentence "Smith punched Jones" surely has a decomposition not wholly unlike that of the corresponding proposition. But it hard to see how the class of logical consequences of *Smith punched Jones* could have a structure at all like that of that sentence or that proposition.

This fact is important from the standpoint of somebody who wants his theories to explain, or at least be consistent with, the fact that languages can be learned and with the related fact that propositions can be grasped. As Fodor (1975, 1998) makes clear, anyone who understands "Smith punched Jones" can also understand "Jones punched Smith."[4] Anyone who can understand "Mary is tall", and "Fred is short" can also understand "Fred is tall" and "Mary is short." These facts cannot be explained unless it is assumed that the things meant by "Fred is tall" and "Fred is short" have a constituent in common corresponding to the word "Fred" – unless, to generalize this point, it is assumed that the things meant by sentences typically have discrete constituents corresponding to the expressions composing those sentences. The class of logical consequences of "Fred is tall" (or of the proposition *Fred is tall*) does not have any discrete part corresponding to "Fred." In any case, it would take considerable artifice to find any such part.

Why these points are consistent with our analysis of properties and individuals

The points just made might seem in tension with the analysis given in the last chapter. There we argued that terms that expressions denoting individuals, e.g. "Fred" and "Sally", are to be understood contextually: they are *not* to be understood by pairing them off with the right entities, since such entities are not to be found. But in the last paragraph we argued that the thing meant by "Fred is tall" must have a constituent corresponding to Fred.

Given an analysis due to Richard Montague (1974), this tension is easily eliminated. According to Russell, if an expression parses out, i.e. if it is to be understood contextually, then it has no "meaning in isolation" and therefore fails to correspond to

4. Of course, a person could know what is meant by "Jones punched Smith" without knowing what is meant by "Smith punched Jones." An example of such a person would be someone who doesn't speak English but has been told what "Smith punched Jones" means. But, as we discussed in Chapter 13, such a person doesn't really understand that sentence.

Our point in the previous chapter was not that Smith doesn't exist or that there aren't instances of pain. Our point was not that there is no isolable entity *of any kind* corresponding to the word "Smith" or to "this instance of pain." It is that no isolable constituents of the *spatiotemporal world* correspond to such expressions. The things meant by those expressions are more abstract than is usually thought. As we saw, any instance of pain, even an instance of some maximally specific kind of pain, is really a commonality holding among states of affairs. In its turn, that maximally specific kind of pain is a commonality holding among such commonalities. The property *pain* is a commonality holding among such commonalities holding among such commonalities. Similar remarks are true of "Smith."

This shows that "Smith" and "this instance of pain" don't have isolable *spatiotemporal* significances. But it doesn't show that they don't have isolable significances *tout court*. They *do* have such significances, these being the commonalities just discussed. So given only our views as to what Smith is, and as to what properties and property-instances are, we are by no means barred from holding that "Smith" and "this instance of pain" have isolable significances. Our view was that those significances are not *spatiotemporally* discrete entities – and that view is an independently plausible one.

Propositions as sets of their logical consequences (continued)

We've already discussed two difficulties for the view that the proposition *Smith punched Jones* is identical with the class of its logical consequences. There is another well known problem. *Smith punched Jones* has the same logical consequences as *Smith punched Jones and 1+1=2*, even though those are distinct propositions.

Given this fact, it is not an option to say that *Smith punched Jones* is identical with *the* class of its logical consequences – for there is no *one* such class. Thus if we were to hold onto the view that propositions are identical with classes containing their logical consequences, we would have to say that *Smith punched Jones* was identical with some structuring or ordering of those consequences and that *Smith punched Jones and 1+1=2* was identical with a different ordering of those same consequences. In general, we would have to say that propositions were orderings of their own logical consequences, and that analytically equivalent propositions were different orderings of the same propositions. Otherwise, equivalent propositions would be no more distinguishable than the unordered sets (2,4,6) and (4,6,2).

But here there arises an analogue of a problem already discussed. It isn't clear what the right structuring would be, and the view just discussed is entirely programmatic until that structuring is identified. So the view in question is, from that viewpoint, comparable to the view that *Smith punched Jones* is <<Smith, Jones>, punched>. The former view, like the latter, is correct only *given* some as of yet unknown fact about the structures of propositions. But knowledge of the identity of that structure is precisely what we want from an analysis of propositions.

Also, any set S that contains all the logical consequences of a given proposition P contains P itself, and also contains *either P or there are square circles*, and so on. So, on pain of vicious circularity, we cannot identify P with any set that contains *all* of P's logical consequences. At most we can identify P with some subset of those consequences. But then the question arises what the right subset is.

I do not believe that this particular problem is fatal to the view that propositions are sets of their own consequences; for I believe that it is not hard to identify the relevant restrictions. But this isn't a matter that is worth pursuing since we've seen that, independently of this issue, the view in question is either wrong or programmatic to the point of emptiness.

The possible-worlds approach

Possible Worlds Semantics (PWS) is the thesis that a proposition is a function from worlds to truth-values. So *Smith punched Jones* is a function that assigns truth to worlds where Smith punched Jones and falsity to worlds where Smith didn't punch Jones (but where Smith and Jones exist), and that assigns either falsity or no truth-value to worlds where either Smith or Jones doesn't exist.

Any adequate assessment of the merits and demerits of PWS would be quite an involved task.[6] Fortunately, given our purposes, only a few brief remarks are necessary. If by a "world" is meant a set of propositions, then it is viciously circular (and regressive) to say that propositions are functions from worlds to truth-values. If we say that worlds are *non*-propositional representations, then we are conceding that there is non-propositional content – this being exactly the point that we are trying to establish in this chapter. If we say that worlds are *concrete* entities, like our world, then PWS involves the dubious view that, for each possible proposition, there is an actual world where it is true.

PWS also has the problem that it cannot distinguish between *1+1=2* and *triangles have three sides*, given that those propositions are true in the same possible worlds. Advocates of PWS deal with this by saying that propositions are *structured* assignments of truth-values to worlds (Lewis 1975, Cresswell 1985: 446–452). So even though *1+1=2* and *triangles have three sides* assign the same truth-values to the same worlds, they do so in different ways. In one case, the concept of addition is involved in the assignment; in the other case it is not. In one case, the concept of triangularity is involved in that assignment; in the other case it is not. Those propositions thus have different internal structures and are therefore distinct.

Far from saving PWS, this position eviscerates it. For, according to it, propositions are individuated entirely by their internal structures: the worlds to which they assign truth-values drop out, and the heart of PWS is thus abandoned.

6. In Kuczynski (2007), I try to give a relatively complete account of what the problems are with PWS, and also how PWS could try to circumvent them.

Permit me to clarify this last point. We have no idea what Little Timmy's belief is if we know only that his belief is true in every world. For given only that information, that belief could be any one of the following:

(i) 1+1=2

(ii) there are continuous functions that cannot be differentiated at any point.

(iii) There are infinitely many primes.

(iv) Arithmetic is incomplete.

(v) Triangles have three sides.

If we want to know what Timmy believes, we also need to know the identities of the *constituents* of the proposition believed in, and we need to know how those constituents are arranged in that proposition. But given *that* information, there is no need to know in what worlds that belief is true, since we already have all the information we need to answer the question "what is the identity of the proposition that Timmy believes to be true?"

Of course, given an answer to that question, we know in which worlds that proposition is true and false (i.e. to which worlds it assigns truth and falsity). In other words, we know what is sometimes referred to as the "extension" of that proposition. But, as we've just seen, a proposition's extension is, by itself, useless in the way of indicating that proposition's identity, since infinitely many distinct propositions will have the same extension.

So if it is to avoid falsely identifying *1+1=2* and *triangles have three sides*, PWS must see propositions as being individuated by their structures. But in that case, the extensions of those propositions drop out; and PWS ends up being a version of the theory, already considered, that a proposition is a structure of some kind. PWS thus ends up collapsing into (a close relative of) the view that *Smith punched Jones* is the ordered pair <<Smith, Jones>, punched>.

There is yet another problem. Suppose that there is only one concrete world. In that case, *snow is green* and *coal is purple* assign the same truth-values to the same worlds, since they both assign falsity to this world and this world is the only one. So if those propositions are to be given different extensions, we must embrace the dubious view that there are, indeed, different concrete worlds. (We've already discussed why it is not an option, at least not in this context, to identify worlds with either sets of propositions or non-propositional representations.)[7]

7. This is only the beginning of a statement as to what is wrong with PWS. In Kuczynski (2006), I provide a more detailed assessment of PWS. But for our purposes, the remarks made in the preceding paragraph ought to be enough to show that, in this context, PWS does not provide a viable answer to the question "what is a proposition?" I leave it open whether there are contexts, e.g. contexts of a purely logical or mathematical kind, where PWS is adequate.

David Lewis' analysis: propositions as properties of worlds

According to David Lewis (1986), a proposition is a "property of a world." Let P be the proposition *Smith punched Jones.* That proposition is true in some possible worlds and false in others. And for that proposition to be true in a world W is for W to have certain properties; it is, to use Taylor's expression, for W's quantum to be rippled in a certain way. Hence Lewis' view.

Permit me to clarify the viewpoint just presented. An artist cannot *just* project an image of Lincoln onto a canvass. He must do so one drop of paint at a time. (Even if an artist could instantaneously project Lincoln onto a canvass, that would consist, not in his not having to put the requisite thousands of paint drops on the canvass, but in his being able to put them all there simultaneously.) Similarly, given some contingent proposition P, even God cannot *just* make P be true in W. He must do so by wrenching W's quantum into shape – by guaranteeing the occurrence of the right micro-events. God cannot make P be true in a world W whose micro-constituents are qualitatively identical with those of a world W* where P is not true. Even He must comply with metaphysical necessities. As Wittgenstein (1922) said, even God cannot create a world where one and one don't make two.

In wrenching W's quantum into shape, what is God doing? He is making a dent in it – he is doing to it what the artist does to a canvass or what a metal-worker does to a sheet of aluminum. He is making it instantiate the right property. So for P to be true in W is for W to instantiate a certain property. (The property in question is *not* the trivial one of being a thing x such that P is true in x. Rather, it is the property of comprising micro-events that collectively form a certain pattern. It is the property, in other worlds, of having a lot of little ripples that form a big ripple of a certain kind. And since each of those little ripples can be understood independently of P, Lewis' analysis isn't trivial or circular.) So P is a property of worlds, and P is true in a world if that world instantiates it. What we said about P is true *mutatis mutandis* of any proposition. Therefore propositions are properties of worlds.

Evaluating Lewis' analysis

There is much truth in this analysis, and it is dramatically better than the others we have considered. In fact, the analysis that I will propose draws heavily from it. But there are two reasons why Lewis' analysis is unacceptable as it stands.

If I say to you "Smith punched Jones and 1+1=2", I am not telling you anything about how this world differs from others that I am not telling you by saying either "Smith punched Jones" or "Smith punched Jones and triangles have three sides." (At the same time, in uttering any given one of those sentences, I am giving you information – though not spatiotemporal information – that I would not be giving you in ut-

is true. What is involved in (*)'s being true? It is true in virtue of the fact that various properties are instantiated. The property of being a certain kind of object (a plant) is instantiated in a certain place and time, and the property of being green is instantiated by that object.[8]

If various properties are instantiated in a certain place, at a certain time, then (*) is true. If those properties are *not* instantiated in that place, at that time, then (*) is false. This suggests that (*) *is* a set of properties, and that for (*) to be true is for the members of that set to be instantiated.

The problem is to identify a set that has the right ordinal or structural properties. More exactly, the problem is to identify a set that satisfies two requirements. First, (*) is true exactly if all the members of that set are instantiated. Second, facts about the membership of that set can be put into an intuitively satisfying correspondence with facts about the decompositions of sentences like "D is green" (and "that plant over there is green") and therefore with facts about the decomposition of (*). This problem can be solved.

Let us begin with a point that we discussed a moment ago, when we were evaluating Lewis' analysis. There is *some* property – we will refer to that property simply as "#1" – that a world has in virtue of the fact that (*) is true in it. That very property is had by a world in virtue of the fact that, in it, any one of the following is true in that world:

(i) D is green and 1+1=2,

(ii) D is green and triangles have three sides,

(iii) D is green and there are infinitely many primes,

and so on.

#1 cannot be *identical* with (*). This is an immediate consequence of the considerations that we put forth in defense of our rejection of Lewis' analysis. At the same time, (*) is true in W iff #1 is instantiated.

Given this, I propose that DP is identical with a set S *one* of whose members is #1, and I propose that each of (i)-(iii) is a set that has #1 as a member. I further propose that for any given one of these propositions to be true is for the members of the corresponding set to be instantiated. But, to account for the decompositional differences holding between any two of the four propositions in question, I will also propose that no two of these sets have exactly the same members (even though, as we will see, they share #1 along with some other properties).

For a moment, let us speak as semanticists, and not as metaphysicians. As semanticists, our inclination is to say that "D is green" decomposes into (inter alia) "D" and

8. In this context, we will, for brevity's sake, ignore the distinctions between properties and hyper-properties and hyper-hyper-properties...and will simply use the term "property." Also, in this context, we will speak rather naively about the nature of property-instantiation and of propertyhood: we will not always make the necessary allowances for the points developed in the previous chapter as to the nature of properties. But we will see that this is *purely* an expository aid – a way of keeping our discussion from being prohibitively long and tedious, and that there is no difficulty reincorporating our contentions about properties into our analysis.

"green." Our inclination is thus to say that "D" and "green" are well-formed parts of "D is green" and, therefore, that these expressions correspond to isolable constituents of (*), i.e. of what is meant by "D is green." And, as semanticists, our inclination is to say that each of these morphemes corresponds to some discrete and ultimate constituent of what is *meant* by (*).

We've already discussed why the things that we refer to as "individuals" – vases, plants, people, animals, and so on – can be thought of as properties. That is how we will think of them in this chapter. Given this, let #2 be the property corresponding to "D", and let #3 be the property corresponding to "green." Finally, let S be a set that contains all and only #1, #2, and #3.

Given that S comprises #1, it immediately follows that (*) is true if the members of S are instantiated. In fact, the converse follows as well. If #1 is instantiated, then so are #2 and #3. So (*) is true exactly if all of #1, #2, and #3 are instantiated.

Notice that S has one part corresponding to "D", another part corresponding to "green", and a third part corresponding to a certain way of "combining" those two parts. A world instantiates #1 iff it instantiates #2 and #3 and also a third property P that satisfies the following two conditions. First, the instantiating of P involves, i.e. is sufficient for, the instantiating of #2 and #3. Second, the instantiating of both #2 and #3 is necessary, but not sufficient for the instantiating of P. (Even if D exists in a world W, and the property of being green is instantiated in W, it doesn't follow that *D* is green in W. It could be that, in W, D is purple and it is some other object that is green. So, as we said, the instantiating of both #2 and #3 is necessary, but not sufficient, for the instantiating of P.)

(*) is thus a structure that has the following properties. It has an isolable part corresponding to D and an isolable part corresponding to the property of being green; and it *also* has a part that in some way *combines* those two parts – that combines them in such a way that, for (*) to be true, it is not enough that *something* or other be green or that D have *some* property or other, it being necessary that D specifically have the property of being green specifically.

S has an analogous structure. It has one part corresponding to D, another part corresponding to the property of being green, and a third part (#1) that combines the first two in a certain way. When all of the members of S are instantiated in a given world W, it follows that three things are the case in that world:

(a) D exists;

(b) there is an instance of the property of being green; and

(c) D itself is such an instance.

Thus, we may naturally identify (*) with S, and (*)'s being true in a given world with the members' of S being instantiated in that world.

The unity of the proposition

It is obvious that (*) involves some way of "combining" or "synthesizing" D with the property of being green. The problem is that the nature of this synthesis has never been identified. (It has always been described to us in empty metaphorical terms, such as "saturation" and "juxtaposition.") Given our analysis, we are in a position to identify the nature of this synthesis.

First of all, when it is said that (*) "consists of" D and greenness, or (equivalently) that D and greenness are "combined" in a certain way in (*), the terms "consist of" and "combine" obviously don't denote spatial relations. They instead denote abstract relations of *dependence*. Here it may help if we switch to an example that has more relational structure than (*). (We will come to back (*) shortly.) Consider the proposition:

(**) Smith hit Jones

Obviously (**)'s existence presupposes, and thus depends on, that of Smith and Jones and the relation of hitting. Further, if (**) is true, then so are the propositions *something hit Jones*, and *Smith hit something*, and also *something hit something*. The truth of (**) thus depends in a certain way on facts about Jones, Smith, and the relation of hitting.

There is more to say in this vein. (Here we must keep it firmly in mind that Smith and Jones, and (so-called) individuals generally, can be thought of as properties.) (**)'s existence presupposes, not just that of Smith, Jones, and the relation of hitting, but also that of a certain "synthesis" (whose nature has yet to be described) of these three things. And (**)'s being true in W involves more than there being instances in W of Smith, Jones, hitting, Smith's hitting somebody, and somebody's hitting Jones. Those instances must be combined in W. After all, if Smith hit Brown, and Aaron hit Jones, then all of the properties mentioned will be instantiated in W, but (**) won't necessarily be true there.

X is a constituent of proposition Y iff Y depends on X in a certain way, in other words, iff there is some property P such that X's having P is necessary for Y's being true. Of course, as it stands, this statement is much too permissive. For example, the number two has the property of being a thing x such that snow is white. Therefore, there is some property P such that 2's having P is necessary for snow's being white. But that number is not a constituent of the proposition that snow is white. Nonetheless, even though, as it stands, the statement *X is a constituent of Y iff, for some P, X's having P is necessary for Y's truth* is both wrong and vague, it is still a good jumping-off point for our analysis of propositional structure. And we will soon replace that wrong and vague statement with a correct and precise one.

Before we continue, we should deal with an apparent problem with our analysis. The proposition:

(***) if Smith hit Jones, then Smith hit somebody

can be true without Smith's hitting anyone or Jones' being hit by anyone or, in fact, anyone's hitting anyone. But notice that this is a molecular proposition, and that, as such, it

affirms a relationship *not* between Smith and Jones, but between *propositions*. And notice that those two propositions – as opposed to Smith, Jones, and the relation of hitting – are the *immediate* constituents of (***). Notice also that, just as the truth of *Smith hit Jones* depends on facts about its immediate constituents, so the truth of (***) depends on facts about *its* immediate constituents. So given only that (***) doesn't imply any particular fact about Smith or Jones or the relation of hitting, there is no reason to reject our view that constituency-relations are to be understood in terms of relations of dependence. In any case, we will deal with molecular propositions in a moment.

Let us once again look at (*). (*)'s existence presupposes that of D. (Remember how (**)'s existence presupposes that of Smith and Jones). (*)'s being true in W involves there begin instances in W of D and of the property of being green. (Remember how (**)'s being true in W involves there being instances of Smith's hitting somebody, somebody's being hit, and so on.)

Now let us look at S in light of these facts. S's existence presupposes that of D (and, of course, that of the property of being green). In order for all of S's members to be instantiated in W, it is necessary that both D and the property of being green be instantiated there. But, as we discussed, this is not sufficient.

So far, then, there are significant parallels between (*) and S, and also between (*)'s being true and S's being such that all its members are instantiated.

After this point, it becomes hard to determine to what extent facts about S parallel facts about the structure of (*). This is because we know so little about the latter. So far as we have such knowledge, it is given by vague statements such as those already discussed, e.g.

(#) where propositions are concerned, the concept of constituency is to be understood in terms of that of the concept of (logico-metaphysical) dependence

But by identifying (*) with S, and (*)'s being true with S's members all being instantiated, we can fill in these gaps in our understanding, without violating our pretheoretic intuitions, vague though they may be, as to the nature of propositional structure.

(#) was our starting point. But (#) is obviously unacceptable as it stands. The truth of (*) is probably constitutively, and not just causally, dependent on facts about physical law – on facts about protons, electricity, gravitation, and so on. It is very hard to believe that D – that very plant – could exist in a world governed by different physical laws or forces, or in a world that didn't comprise electrons or protons or any of the micro-particles found in our world. So it is very hard to believe that D could exist in a world where, for example, there was no gravitation. But clearly the concept *gravitation* is not a constituent of (#), at least not in the same sense as the concept *green* or the concept *D*; and the same is true of the concepts *electricity, proton, photosynthesis*, and so on. So even though it may be true, even truistic, (#) is not enough; it doesn't tell us why D is a constituent of (*), whereas the concept of electricity is not.

But our analysis can help solve this problem. D is a *member* of S. (When discussing S's membership, we referred to D as #2; but obviously that isn't important.) Similarly

the property of being green (#3) is a *member* of S. By contrast, the concepts of electricity, gravitation, and so on, are not *members* of S. So by identifying S with (*), we replace (#) with a precise and clear statement – a statement that agrees with (#), so far as the latter goes but that, unlike (#), isn't unclear or otherwise exceptionable.

If S's members are instantiated, that *entails* (inter alia) that D is instantiated and that the property of being green is instantiated. By contrast, it doesn't *entail* any statements regarding gravitation, electricity, or photosynthesis – even though, quite possibly, the members' of S being instantiated is constitutively dependent on facts about gravitation, electricity, and so on.

In conclusion, if we identify propositions with *sets* of properties, and a proposition's being true with all of its members being instantiated, then we can give clear, precise, and extensionally correct answers to important questions relating to propositional structure.

Another illustration of our analysis

Before we deal with molecular propositions, it may be appropriate to give one more illustration of our analysis of atomic propositions. This is because (*), the proposition in terms of which we illustrated our analysis, has minimal relational structure; and it is thus worthwhile to show that our analysis doesn't break down when applied to relationally richer propositions. Given this, let us consider (**) once more.

It is pretty clear that Smith, Jones, and the relation of hitting are constituents of it. It also seems clear (though this point has a more theoretical quality) that (**) also has as constituents the "propositional functions": *Smith hit y*, *x hit Jones*, and *x hit y*.

It is also clear that these things must be "combined" in some special way if (**) is to result: not just *any* arrangement of those entities will do.

Frege explained why this last requirement must be met. We briefly discussed Frege's argument in the last chapter. Here we must develop what we said.

Consider the following list of expressions:

(**F) Smith, Jones, the relation of hitting, Smith's hitting something y [or: the propositional function *Smith hit y*], x's hitting Jones, something's hitting something.

(**F) isn't a sentence; it doesn't encode a proposition. Further, a sentence will not result no matter how many referring terms we *add* to (**F). Suppose that "COM" denotes the special (and, as of yet, unidentified) way that Smith, Jones, etc. must be combined if (**) is to result. If we add "COM" to (**F), what results is:

($**F_2$) Smith, Jones, the relation of hitting, Smith's hitting something y [or: the propositional function *Smith hit y*], x's hitting Jones, something's hitting something, COM.

(**F_2) is no more a sentence, and no more encodes a proposition, than (**F). Obviously no expression would result from (**F_2) no matter how many more denoting expressions we added to it. In general, a sentence is not a (mere) list or heap of referring-terms.

What does "Smith hit Jones" have that each of (**F) and (**F_2) lacks? "Smith hit Jones" is grammatical, whereas the other two are not. In "Smith hit Jones", the expressions are appropriately inflected and they occur in the right order. This is not the case with respect to either (**F) or (**F_2).[9]

We've seen that we can't turn (**F) into a sentence by adding more *referring* terms. We've also seen that it is facts about grammar – inflections, word-order, and the like – that are needed to turn (**F) into a sentence. It seems, then, that grammatical morphemes do not, at least not *generally*, refer. The ordinal information that they encode is not to be understood in terms of their *referring* to anything.

Let us turn our attention back to (**). We've seen that *among* its constituents are: Smith, Jones, the relation of hitting, Smith's hitting something [the propositional function *Smith hit y*], x's hitting Jones [the function: *x hit Jones*], and something's hitting something [the function: *x hit y*]. But what we haven't seen is how these things must be combined if a proposition is to result. And – what would seem to be a related point – we haven't seen exactly what it is that the inflections in "Smith hit Jones" do. (In this context, I will use the term "inflection" to refer to all grammatically significant facts – e.g. word-order, intonation, and so on.[10]) We've seen that they "combine" the constituents just mentioned in *some* way or other; we've seen that they *don't* do so by *referring* to anything; and we've seen that, as a result of their performing this (as of yet underdescribed) feat of "combining", a proposition is meant by "Smith hit Jones." But we haven't yet put our finger on the identity of this mode of combination. But, in light of what we said in connection with (*), we may, I think, be able to do so.

Let us begin with Lewis' insight. There is some property – we will call it simply "#1*" – that a world has in virtue of the fact that (**) is true in it. For analogues of

9. Here it would be more convenient if we were writing in a richly inflected language, such as Russian or Latin. It would then be clearer how grammar *unifies* expressions into more complex expressions. In English, there is quite as much grammar as there is in Russian. But, to a large extent, English-grammar is either realized through word-order or is without any acoustic (or orthographic) representation. So, where English sentences are concerned, its presence is less likely to be discerned than it would be if we were dealing with Russian sentences. But we mustn't on that account think that English is less grammar-rich than, say, Russian.

10. I mention intonation because where some languages are concerned, e.g. Mandarin, given two utterances that differ in intonation but are otherwise identical, one may be grammatical while the other is ungrammatical. Even in English, it is, at least arguably, *un*grammatical not to end questions with a certain kind of intonation. So in some cases, intonation is a way of rendering grammatical an otherwise ungrammatical utterance. This is not *always* the case, of course.

reasons already discussed, a world W instantiates #1* in virtue of its being the case that, in W, any one of the following is true:

(i) Smith hit Jones and 1+1=2

(ii) Smith hit Jones and triangles have three sides.

(iii) Smith hit Jones and there are infinitely many primes.

Obviously this list goes on *ad infinitum*.

So given that (**) is not identical with any of the propositions on that list., (**) is cannot be *identical* with #1*. But it is surely suggestive that (**) is true exactly if #1* is instantiated.

Given this, let S_2 be a set *one* of whose members is #1*. As we've discussed, Smith and Jones can be thought of as properties. Let #2* and #3* be those properties. It goes without saying that the expression "being hit by Smith" (which corresponds to the function *Smith hits y*) and "hitting Jones" (*x hits Jones*) and also "hits" (*x hits y*) correspond to properties. (Following tradition, we can think of the relation of hitting as a property of ordered pairs.) Let #4*, #5*, and #6* be those properties. Finally, let S_2 be a set that has for its members all and only #1*-#6*.

For obvious reasons, if #1* is instantiated, then so are #2*-#5*. And, as we've already discussed, (**) is true (in a given world) exactly if #1* is instantiated (in that world). It follows that (**) is true in a world exactly if all of #1*-#6* there. So, thus far, there is no reason *not* to identify S_2 with (**), and no reason not to identify (**)'s being true with S_2's being such that all its members are instantiated.

Further, S_2's constituency is comparable, in an obvious way, to the constituency of (**), at least so far as we know anything about the latter. We know that Smith, Jones, the relation of hitting are "constituents", in some sense of the word, of (**). We also have reasons, given to us by Frege (and, since his time, by many others) to suspect that the functions *x hits Jones*, *Smith hits y* are also constituents (in some sense of the word) of (**). Further, we know that (**) is what results when these (or some subset of these) various entities are "combined" in some mysterious way. S_2 has a constituent corresponding to *each* of the constituents of (**), and the mysterious operation of "combining" just mentioned can be understood in terms of facts about S_2's membership.

S_2 has a discrete part corresponding to each of Smith, Jones, the relation of hitting, and so on. And we know exactly *how* #1*-#6* – the parts corresponding to the Smith, Jones, and so on – relate to S_2: they are *members of it*. That is as clear a relationship as we can hope to find. So, thus far, facts about S_2's composition correspond to what we know about (**)'s composition – with the qualification that, in the case of S_2, it is extremely clear what those compositional facts are.

We know that for Smith, Jones, and so on, to be "constituents" of (**) is for the truth of the latter to have some kind of dependence on facts about the former. But we don't know what exactly that kind of dependence is. This problem vanishes if we identify (**)'s being true with S_2's being such that all its members are instantiated. If all S_2's

members are instantiated in W, then Smith hits somebody in W, Jones is hit by somebody in W – and, of course, somebody hits somebody in W, not to mention that Smith and Jones exist in W. Similarly, (**)'s being true in W involves Smith's hitting somebody in W, Jones' being hit by somebody in W, and so on. Our analysis is therefore consistent with everything we know about the dependence-relations that hold between propositions and their constituents.

At the same time, as we discussed, not *all* dependence-relations correspond to relations of propositional constituency. Smith's hitting Jones is (we may suppose) constitutively dependent on various facts about neurons. But the concept *neuron* isn't a constituent of (**). Further, if Smith hit Jones, it follows logically (though not formally) that Smith put some kind of pressure on Jones' body. But the concept *pressure* isn't a constituent of (**). So it isn't enough to say: X is a constituent of proposition Y iff Y's being true involves, or is otherwise metaphysical dependent on, some fact about X. Though true, that statement is too broad, and it doesn't say why the concept of a neuron is not, whereas the property of hitting is, a constituent of (**).

But this problem vanishes if we identify (**) with S_2. The concepts (or properties) *neuron* and *pressure* are not *members* of S_2. So if we identify (**) with S_2, it is clear why the concepts *neuron* and *pressure* are not constituent of (**), even though states of affairs instantiating those properties are metaphysically or logically necessary for the truth of (**). Further, if all of S_2's members are instantiated, that *entails* that somebody or other hit Jones, but it doesn't entail anything having to do with neurons.

An apparent problem for our analysis

Here it might seem that we run into a problem. If S_2's members are all instantiated, that *does* entail, at least arguably, that Smith put some kind of pressure on Jones and that Smith thus altered the balance of forces acting on Jones. But the concepts *pressure*, *balance of forces*, and so on, are not constituents of (**). So it might seem that there has been a breakdown in our attempt to understand (**)'s structure in terms of facts about what is entailed by the supposition that all of S_2's members are instantiated.

But there hasn't really been a breakdown. There is an obvious sense in which the truth of *Smith hit something* is, whereas any proposition about pressure or force is not, an *immediate* consequence of the supposition that S_2's members are instantiated. One's making the latter supposition is *identical with* (inter alia) one's supposing that Smith has the property of hitting something, that Jones has the property of being hit by something, and so on. By contrast, one's supposing that S_2's members is obviously not *identical* with one's making suppositions about alterations of the balance of forces involving Jones. So even though the supposition that S_2 is instantiated entails both *Smith hit something* and also *Smith altered the balance of forces acting on something*, these two entailments differ from each other in some fundamental respect. Our analysis enables us to say exactly what that difference is. Indeed it practically amounts to a description

of that difference. Our analysis therewith enables us to say why the property of being a force is not, whereas the property of hitting is, a constituent of (**).

The bearing of our analysis on SCT

Before we discuss molecular propositions, let us discuss the bearing that our analysis of propositionality has on the viability of SCT. If our analysis is right, a proposition is a set of properties. Given what we said earlier, this means that any proposition is at an extraordinarily high number of removes from anything that could be the content of any experience (i.e. any perceptual or sensory experience). Let us now spell out why this is so.

We've already seen why, so far as they cannot be identified with concrete situations, property instances are abstract commonalities holding among situations, and are therefore abstract entities (contrary to what is generally thought). We've also discussed why terms like "red" are not properties of things whose instances can be encountered in experience, but are rather properties of such properties. We had to invent special terms – "R_1", "R_2", and so on – to denote the maximally specific shades of red that one sees. What is true of "red" is true of any expression with a fixed, as opposed to context-dependent, reference. Context-dependent expressions, e.g. "that exact shade of red", can denote properties had by situations that can be experienced, i.e. seen, heard, touched, and so on. But context-dependent expressions must be built of context-*in*dependent ones; and the latter, as we've discussed, necessarily have abstract entities for their significances.

We've also discussed why terms like "Smith" and "Jones" are not as dissimilar as one might think from terms like "red" and "pain." The former, no less than the latter, fail to have concrete situations for their semantic contents, and instead have for their semantic contents abstract commonalities holding among situations or worlds.

If our analysis of propositions is correct, then a proposition is a *set* consisting of various properties. And in most cases those properties are really *hyper*-properties (properties of properties, or properties of properties of properties, or...) The only cases where the constituents of a proposition are *mere* properties, as opposed to hyper-properties, are the cases where those propositions are to be expressed using demonstrative expressions like "*that* particular shade of red" (or neologisms like "R_1"). For a proposition to be true is for the properties that are members of it to be instantiated, i.e. it is for all of those (hyper-)properties to have the *higher*-order property of being instantiated.

Molecular propositions

Earlier we saw that molecular propositions might pose a problem for our analysis. Let us allow an imaginary objector to articulate exactly what that problem would be:

> Consider the proposition:
>
> (N**) "Smith did not hit Jones."
>
> Surely (N**) has Smith, Jones, and the relation of hitting as constituents. In fact, (N**) has all of the constituents had by (**). (At the same time, (N**) has an extra constituent, corresponding to the operation of negation.) But for (N**) to be true is not for those properties to be instantiated. Indeed, it is for those properties, or at least some of them, *not* to be instantiated. This makes it questionable whether you have analyzed propositions correctly and, therefore, whether there is any merit to your anti-SCT use of the concept of a proposition.

(N**) is a molecular proposition. It is the proposition: *it is not the case that Smith hit Jones.* (N**) has two *immediate* constituents. These are (**) and the concept of negation. Jones is not an *immediate* constituent of (N**). (N**) is a statement *about* (**). (N**) says of some proposition that it isn't true. If our analysis is correct, this is equivalent to saying that the members of S_2 are not instantiated.

At the same time, we want to hold onto the idea that a proposition is a set of properties, and that for a proposition to be true is for the members of that set to be instantiated. In other words, we don't want to understand the concepts *proposition* and *truth* one way where atomic propositions are concerned, and a different way where molecular propositions are concerned. So we must show that (N**) is some set SN of properties, and that (**N) is true iff all of SN's members are instantiated. This can be done.

Remember #1* – the property had in common by all and only those worlds where (**) is true. As we discussed, #1* is a certain way that a "quantum" can be rippled. Now consider all the worlds that *aren't* rippled that way – that have ripples incompatible with the truth of (**). Let $\#N_1$ be *that* property.

Of course, in this context we *described* $\#N_1$ negatively. We described it in terms of some proposition's *not* being true. But, to echo a point made by Frege (1918), it doesn't follow that $\#N_1$ is itself any more "negative" than #1. Any given state of affairs can be described positively or negatively. We can say "Brown failed to make it to the finish line" (negative characterization) or "Brown collapsed before the finish line" (positive characterization). The first sentence describes a state of affairs in terms of the falsity of some proposition (*Brown made it to the finish line*); the second describes that same state of affairs but *not* in terms of the falsity of some proposition. Similarly, suppose we were so naturally aggressive that the normal course of events was to hit other people, and that it was more disruptive to our psychologies and cultures when people *refrained* from hitting others than when they actually did so. In that case, we might have a special verb "to frit", meaning to *refrain from hitting*. So "Smith frit Jones" would mean:

Smith refrained from hitting Jones (despite there being innumerable internal and external pressures acting on Smith that would tend towards his hitting Jones). In that case, the state of affairs that, in actuality, is expressed by (**) would be expressed negatively, i.e. by the sentence "Smith did not frit Jones." So $\#N_1$ is quite as "positive" a property as #1, and there is no threat of vicious circularity in our use of "Smith hit Jones" to identify #1. This is because we were using that sentence *only* to identify that property; and, as we just saw, that same property could have been identified *without* using the sentence "Smith hit Jones" or any synonym. Given this point, let us move on.

Let SP be the property of being identical with S_2 or, if you prefer, with (**). The property of being *identical with* a set can be instantiated even if the members of that set are not. The property of being *identical* with is instantiated in any world where that set *exists*, it being irrelevant whether the members of that set are instantiated. Let Z be the set whose sole member is the property of being a gold object in New Zealand weighing more than a million pounds. Z exists in this world (and, arguably, in every world). The property of being *identical* with Z is instantiated in this world, even though its member is not.

Finally, consider the property of *not* being instantiated. This is, of course, a property had by properties. (It is had by the property of being a mansion on Earth made out of solid gold.) It is thus a higher-order property (in fact, it is of an even higher-order than most of the properties we have considered). Let NEG be this property.

Let S_3 be the set that consists of NEG, Z, and N_1. (N**) is true in all and only those worlds where N_1 is instantiated. Given any world where N_1 is instantiated, it follows, for obvious reasons, that each of Z and NEG is instantiated. So (N**) is true in a given world iff all of S_3's members are instantiated in that world. Further, S_3's membership corresponds with the decomposition of (N**), at least in so far as the latter is perspicuously represented by sentences expressing that proposition, e.g.

(&) "it is not the case that Smith hit Jones."

(&) has two immediate, proper constituents, namely: "that Smith hit Jones" and "it is not the case." So if we count "it is not the case that Smith hit Jones" as a constituent (an improper one) of itself, (&) has three immediate constituents. Similarly, S_3 has three members; and each of these members corresponds in an obvious way to the three main constituents of (&). So facts about S_3's membership neatly correspond to facts about the decomposition of (&) and therefore, presumably, to that of (N**); and facts about the conditions under which S_3's members are instantiated correspond neatly to facts about the conditions under which (N**) is true. So there is every theoretical incentive to identify (N**)'s being true with its being the case that the members of S_3 are instantiated. Thus, far from warranting the rejection of our analysis, consideration of (N**) confirms it.

What we said about (N**) is true *mutatis mutandis* of all molecular propositions. I discuss this at length in another work (Kuczynski 2005c), where I also discuss the structure of analytic propositions. But given that our concern here is mental representation – specifically, the viability of SCT – it isn't necessary that we consider the concept of propositional structure in such detail. And given only what we've said thus far about propositions, the implausibility of SCT has been adequately demonstrated.