THEORY of FORMS: FURTHER DISCUSSION

In class an attempt was made to discuss the theory of Platonic forms, partly by using the kind of dialogue that one imagines might have arisen amongst a set of Greek philosophers. This is a very brief summary of the ideas and points that were made in the discussion in class, as well as a discussion in one of the tutorials (see section (B) below). I supplement this with remarks of my own (section (C) below). First, however, we begin by formulating the question at issue:

(A) THE QUESTION AT ISSUE

Very briefly, the argument in question is Plato's argument for the existence of Forms, given in allegorical form in the discussion of "the Cave" (see the "SUPPLEMENTARY NOTES" on the Course Web Page). The argument for Forms typically starts from the observation that instances of justice, or of a "square" can be found all over the place- although it is clear that if we look at a square object it is not a defining instance of a square, but rather it possesses in approximate degree the quality of "squareness". Now Plato, mindful of what was already known in geometry and mathematics, argues that a perfect square exists nowhere in the world of appearances, but can nevertheless be defined mathematically. This is clear not only because a perfect square cannot be found in Nature, but also because any square we do find is only one of many imperfect examples, which hardly define for us a "real" square. Such a definition may not need any elements of the real world for its definition, but nevertheless a square CAN be defined, and in this case it must exist. If so, there must be a "higher realm" of "forms" or "Ideas" in which many such forms exist. In fact there will be a hierarchy of such forms, accessible only to reason rather than to the senses. Although this is not immediately relevant to the question at issue, we note that according to Plato, the highest (ie., most "primitive" or "fundamental") of these was the form called "the Good", a kind of perfection to which all other ideas were subsidiary. Note that ideas or Forms, by their very nature, do not change (unlike the world of appearance); and anything that does change is thus not an Idea or Form. True knowledge can only be of Forms.

This argument (sometimes called the "Many to One" argument) is put in this way to emphasize the importance attached by Plato to Mathematics- undoubtedly he was strongly influenced by the mystical ideas of Pythagoras as well as his concrete work in coming to this formulation. One can also view the argument as an attempt to argue from language, in which names denote different specific objects, called 'particulars', to the existence of what are sometimes called "universals"- a concept due to Aristotle. The idea of Plato is that if we are given a whole bunch of particular 'squares', all of which are actually different but all of which have something in common, then this thing they have in common (what one might call 'squareness'), comes because they all to a greater or lesser degree resemble the perfect 'Square', which exists in the world of Forms.

Another way of looking at this is to say that if we have something like a particular square or a horse, then these are *examples* of squares and horses - but the only thing that makes them so is that they all have something in common. According to Plato, this thing that they have in common is that they resemble or in some way 'partake of' the Forms 'Square' and 'Horse' respectively.

For more details go to the course notes. If you read more by Plato you will be able to explore his other arguments both for, and later on, against, the idea of "Forms". The key thing to understand here is the arguments, not the detailed history- and the best way to do this is not to study them slavishly, but instead to construct your own arguments- this is the first step to doing this kind of philosophy. So as a useful exercise you can begin from the class discussion, summarized below.

(B) CLASS DIALOGUE

The following is a summary of some of the issues and arguments that were brought up by various members of the class. I make no attempt at any kind of detailed analysis of the points that were made - the whole point of this exercise is for you to try and develop these ideas and arguments further yourself. However I have tried to organise the arguments that were discussed and express them in a coherent way, and to make a few remarks on them. In section (C) below, I go into some of the points you raised, and also related points, in more detail, noting both how Plato might have responded to them, and pointing out a few other things you might like to think about.

The issues that were raised in the class discussion can be grouped as follows:

The first set of arguments expressed in the class discussion had mostly to do with the existence of Forms - whether it is right to talk about them at all in the same way that we insist that the physical world "really exists". Note that this is not an epistemological question about how we find out about them/gain knowledge of them, but rather an ontological question about whether they exist at all - and if so, in what sense. This latter question was put very succinctly by one person, who simply asked: "if they do exist, then *where* do they exist?". In other words, where is this "World of Forms"? Note that Plato himself was insufficiently clear on this.

It was then argued in class that Forms might well just be creations of the human mind - that there was no reason to assert that they really existed "out there". In a an elaboration of this argument, it was remarked that if one could view the different approximately circular objects in the world as imperfect representations of a "Circle", then one was not forced to argue for the existence of a real Circle - instead one could just think of it as an idealized limit, in the sense that objects in the real world can be viewed as examplars of a set of objects which 'tend towards' the limiting case of a perfect circle. Although this point was not made explicit in class, it is clear that this argument is similar to the idea of, eg., a velocity being defined in calculus as a limit (for velocity, this limit is just the limiting value of the ratio $\delta x/\delta t$ of the distance δx traveled in a time interval δt, as one lets δt tend to zero).

Let me remark in passing here that there is a difficulty with this argument. The question is - how do we take this limit, and what is going to zero here? If we argue that it is just the different between the set of circles we use and the real Circle that is going to zero, then we obviously already need to have in mind the idea of a real Circle - and we also need to know how to define/measure this difference, in order to define the limiting process. If we can't get past this difficulty, then we are not going to impress Plato - he will simply argue that the idea of the limiting process already presupposes the ideal Circle.

Nevertheless, it was argued, assuming we can properly define this limit, and even if it does presuppose the idea of a perfect Circle, we are still not obliged to suppose this Circle exists 'out there'. Let's note that this is a standard point - it has often been noted in the historical development of philosophy that the existence of some concept or idea does not imply its realization in the real world. Just because we can think of, say, unicorns, does not mean they exist. However there is a subtlety here. Even though unicorns probably don't exist, one has to remark that (i) there is no reason they can't - they might in principle exist out there; and (ii) the concept of a unicorn seems to be in some way constructed from things we are aware of through experience; it is a sort of 'collage' of bits and pieces of things we already know from experience. This then raises the question of whether anything that we can imagine at all is not just built, in some way, from our existing experience. One might apparently assert that all our ideas are in some way constructed from our experience. Note that if this assertion is the case, then we would have to argue that our idea of a Circle is indeed a construct from things in our experience. Plato's answer to this (and it is a good one) is that we are not blank slates - certainly some of our knowledge/understanding must be innate. Another counter-argument to this was given in class - that we clearly can think of things that do not existing any way - such as the idea of 'nothing' (a point of course raised by Parmenides, who argued that the idea was nonsensical; and by Lewis Carroll, who made amusing remarks about the imaginary personnage "Nobody").

All this then brings us back to the question - in what sense does our knowledge, innate or else based on our experience, simply reflect features of ourselves, and our own limitations? It was remarked in class that one limitation we have is that our minds (and perhaps all minds) require us to *categorize* our experiences, thoughts, etc., in a particular way. Thus the objects we imagine are concepts created by the human mind. Thus 'Circles' are purely human (note that all that is really being argued here is that they *may* just be purely human - we have no means of knowing whether other intelligent beings have also the concept of Circle).

Note what this argument implies - that before humans existed, the idea of 'Circle' may never have existed. It is then contingent on human, or other similar intelligent beings, for its existence. In other words, Circles do not really exist out there at all - they are just a concept we have. There was some discussion in class of when the concept of Circle would have first arisen - with *homo sapiens*, or with Neanderthals, or even in some higher mammals or birds. But note that the general argument is unaffected by this detail. This argument can be summarized more generally in the following assertion - that *none* of the structure that we impose conceptually on the world and on ourselves is really *there*. That any structure we discern in the world is simply a creation of our minds.

This summarizes the discussion in class. Let's now look a little more at some of this.

(C) FURTHER REMARKS

In what follows I go over some of the points that are often raised in discussion of Plato's Theory of Forms, and some of the answers given; and I make some remarks of my own. There is a clear overlap with some of the points

made in class, but I extend this discussion to include other points of view.

(1) The Relationship between the World of Appearances and the World of Forms: This problem is often raised, even by those who think that Plato's general ideas are more or less OK. Typical questions that arise are:

(i) We actually only know about individual 'particular' phenomena that we observe; we have no direct access to the Forms, and in fact it seems highly unlikely, to most people, that the idea of Forms would ever occur without the particular kinds of experiences that we do have. From this point of view it seems that the Real World, from which the idea of Forms was extracted, is indeed composed of the objects that we experience. Thus, it seems unlikely that the idea of the form 'Circle' would be conceivable without experience of approximate circles in the world of appearances. Some would go so far as to argue that if you can't observe something *in principle*, then it doesn't exist. So - how can we say that the world of Forms is more fundamental if this world is *inconceivable* (and maybe doesn't even exist) except with reference to the world we experience?

(ii) Suppose it is true that the real world is not a world of Forms, and that there is some more fundamental world of Forms. Then in this case - what is the relation between the 2 worlds? Note also that a similar but more extreme problem arose with the discussion of Parmenides, who dismissed the real world of sense perceptions as quite illusory, and not corresponding in fact to anything 'real' at all. Thus one can ask- in what way are Forms actually *embodied* in our world?

(iii) A final objection to Plato's ideas on the relationship between the 2 worlds follows on from (ii) above. It arises again because Plato was not sufficiently specific about the relation between Forms in his inaccessible worlds, and the phenomena in our perceived world. It is then not only unclear how to understand the real world in terms of Forms- it is also unclear how we are to decide, by doing things in the world of perception, on the truth or otherwise of our ideas about the world of Forms. To put it in modern language- the theory of Forms is UNTESTABLE, because we can only test the truth or otherwise of a theory by operations performed in the real world. So how do we test ideas about the world of Forms?

Remarks: It is certainly true that Plato is not too clear on this general issue, because although he talks a lot about the world of Forms, he does not say so much about the real physical world!

However, one suspects that Plato's response to this would have started with his usual line of argument, viz., that whereas one cannot apprehend the Forms by sense perception, or by any inspection of the real world, they can be examined and understood- at least to some degree- by imperfect mortals, using the *intellect*, ie., using rational thought. Here of course his 2 guiding lights were (i) the ideas of mathematics, and (ii) the Socratic method of exploring and refining concepts, to isolate and extract their essential meaning. In fact Plato did try occasionally to talk about the real world of sense perception, and was rather interested in a number of different features of this world- notably in astronomical phenomena, and in the mechanisms of sense perception itself (for which he had an elaborate theory); see in particular the *Timaeus*. He also had a kind of theory of physics, which was based essentially on Pythagorean forms and the Elements of Empedocles- although Plato was very firm that the universe was in some sense alive, and that it had been molded by a 'Demiurge'.

Concerning the objection that we cannot possibly know about forms in the absence of experience of the world of appearances, Plato argued that we *do* have innate knowledge of Forms - indeed, it would have been hard for him not to, in the face of this objection. In a well-known passage in the *Meno* Socrates coaxes the solution of a geometric problem out of a boy with no previous knowledge of the subject. Plato's argument here was rather peculiar, and the details are not so relevant here (he argued that the boy's innate understanding of geometry came because he had am immortal soul, and that it was the soul that actually had memory of geometrical ideas; but that true understanding of these could only come through ratiocination). The point is that it is hard to avoid the idea that some sort of innate "geometrical understanding" on our part is involved in the discussion of geometrical forms. It has to be admitted that none of this makes it very clear in what way objects that we observe in the world of appearances are related to Forms, or how they 'partake' of them.

This point is made more acute when we ask how one might test Plato's idea (which means of course a test in our world of appearances). By putting this objection in modern terms we make it harder to understand how Plato might have responded. He certainly would have objected that one can test the propositions of mathematics by purely rational means- by 'tests' performed within mathematics itself, by purely logical manoeuvres. But this does not really answer the argument. Actually Plato did have a theory of the universe, and of how it is constructed (although it is

important to note that, in the same way as Parmenides and Democritus, he did not pretend that he was sure it was correct). Given that, for example, his theory of how matter was constructed ultimately reduced to a consideration of geometric forms (the 5 regular or 'Platonic' solids), one can ask what method could, in his theory, give us certain knowledge of its truth (or otherwise)?

To many people in the 21st century, it seems clear that one cannot have certain knowledge of the phenomena of the perceived world, and that it is therefore not clear how it is possible to have any sure knowledge of the world of Forms, or indeed of anything at all. However many mathematicians have argued that at least in logic and mathematics this is not the case - that one can indeed establish mathematical or logical truths, at the severe price that one is dealing only with formally defined objects. The objects of mathematics, in this view, are not so different from the Forms of Plato. Thus his point of view has had a huge and enduring influence. However this still leaves us with the problem of making the link between formal mathematical objects and objects in the real world. We shall see later on that this problem is alive and particularly acute at the present time, because of quantum mechanics (discovered in 1925). We will also see that the whole question of what constitutes mathematical truth was turned on its head in 1931.

Finally, one can ask to what extent one can even unambiguously relate objects in the real world to Forms at all. Thus, eg., the idea of all horses sharing some property or properties is all very well. But in some cases we can't just define something by listing all its defining qualities or properties (as is done in a dictionary). This may be insufficient, or it may even be impossible. In philosophy this is to some extent recognised - for example, philosophers talk about "ostensive definitions" (from the Latin *ostendere*", meaning to show or point to); these are definitions of things given purely by exhibiting them (or an example of them). The necessity of this is particularly obvious for objects of which there is only one example - eg., the 'sky'. In this case, we clearly extrapolate from the example or examples we have in the real world.

From this point of view the definitions we use in discussing many objects in the real world are usually just a kind of classification of the different objects- the lists of qualities help in making this somewhat taxonomic classification. If one wanted to define Forms here, they would have to refer to a list of qualities referring to objects in the real world, not any abstract world.

(2) The Role of our Perceptual/Mental Apparatus: Another set of questions and arguments, clearly related to the first set of questions above, focusses on the fact that what we experience is clearly contingent on specific features of our perceptual and mental equipment. Other living beings on earth, apart from us, have often quite different perceptual systems (eg., bats 'see' very high-frequency sound and use echo-location, insects can often see in the near Ultraviolet, and obviously animals think differently from each other and from us). Clearly all living things have limitations on their perceptual systems, and in their thinking capacity and structure - and it takes no stretch of imagination or ratiocination to see that we ourselves must be limited in many ways in our ways of conceptualising things, as well as in sensing them. Two specific points that are often raised are:

(i) If the 'real world' that is accessible to us in our experiences is so limited and structured by specific features of our sensory systems, then in what way can it be described as real? Clearly our knowledge of it is very limited, in ways that we can only guess. In fact what we do experience is not the real world, but rather a set of impressions or images, and the relationship between these and the real world is clearly a matter of interpretation. And the way we interpret these, and the structure we give them, is clearly contingent not just on our sensory systems and their limitations, but also on the structure of our thought, which is also limited by the functions available to our brains (about which we know very little, and which we cannot 'think outside of' in any case). To summarize - it seems that our understanding of and our knowledge, of both the sensory world and of the world of "Forms", is very limited, and the structure we give to it (and indeed the very idea of the world of appearances and the world of "Forms") is at least partly just a result of particular features of our perceptual and mental apparatus. So it would seem that there is nothing inevitable or sure or "*Real*" about any of this.

On this topic it is often pointed out that there is a lot of 'pre-programming' and specific 'hard-wiring' in the brains and sensory/perceptual systems of animals, including humans - but that a lot of what we perceive things and the way we talk and think depends also on what we are exposed to when young - the brains of babies and the eyes of cats have specific structures built into them when they are born but they way these develop depends on the experiences that they have after birth.

(ii) A related point concerns the limitations imposed upon our understanding of things, and our ability to structure our experience, by the structure of our language (which also has a clear genetic component, more or less the same for all humans, even though languages are learnt entirely after one is born). This leads to the remark that much of modern

physics requires a language not possessed in great measure by the Ancient Greeks, that of advanced mathematics; and that this language has greatly influenced the development of modern science. The basic question that all this discussion leads to is the same as the one above, viz., to what extent is our present or past understanding of the world around us either limited, or even misled, by specific limiting features of our language, and the limitations that these impose on how we can think?

Remarks: It is clear that the main response of Plato to this again revolves around the idea that knowledge acquired by the senses is imperfect, but that one can attain knowledge of the Forms though pure thought. It is interesting that the ideas of Democritus on the limitations on our understanding imposed by our senses are much more sophisticated than those of Plato - curiously, Plato never mentions Democritus ever in his writings. Democritus clearly understood that there was a long chain of physical processes connecting physical objects with our perceptions, and that all our understanding of the world (including that of the perceptual chain) was therefore imperfect. A major defect of Plato, and of the whole school of thought initiated by Socrates, was a disdain for the gory details of the natural world, particularly of human physiology. This led them into a number of silly errors (ones still being repeated by many of the Oxford philosophers of the 2nd half of the 20th century, who were similarly proud of their ignorance of the sciences). In particular it led them to confusion over the relationship between the objects of perception and the objects of mathematics.

It is hard to guess how Plato would have reacted to questions about how the limitations of language might have constrained our understanding. This is because the study of language and logic was hardly begun at this time. We will come back to this question later, particularly in the discussion of modern quantum physics.

(3) Pre-conditions of Rational Thinking: A quite different set of points has much more to do with the purely logical features of Plato's argument, and the characterization of knowledge of the 'Forms' as entirely based on ratiocination. In particular:

(i) It is clear that exactly the way we categorise our experiences will depend on the structure of our perceptual and thinking systems, both of which are very limited. But surely some kind of categorisation is necessary - and it is certainly quite hard to see how we can avoid very elementary distinctions like that between particulars and universals (*cf.* Aristotle), between subject and object, or between appearance and reality. So this leads to the question: How can we understand anything if we don't have a theory of Forms (or some other metaphysical theory which allows us to understand our experiences)?

(ii) Plato attempts to present the case for the theory of Forms in a way which is supposed to convince us that it is logically inevitable. However his 'derivation' of the theory is presented in the form of a conversation, and one can see all sorts of points on the argument that can be queried. Plato (and many generations subsequent to him) were very impressed by mathematical derivations; and Aristotle set the whole idea of formal deductive arguments in motion by inventing the notion of a formal approach to logic. So, with the benefit of our modern understanding of logic: Can we rigourously "*derive*" the Theory of Forms?

Remarks: The first question is actually of some importance for the philosophy of science (and in fact for philosophy in general). Let's just focus on science, and to see why it is relevant to modern science, let's rephrase it in the following way. It is clear that what we currently know of the world around us is based on a careful combination of experiment and theory. In the modern view, experiments are done which test theoretical arguments, and if the theory doesn't work, then we need another theory. It is the experiments that are the 'bedrock', giving us access to the truth, not the theory. But this view (and I have deliberately caricatured it, in a way which, unfortunately, many scientists would like it said) is really so oversimplified that it is very misleading. It is quite clear that any description of an experiment in physics or biology is quite meaningless unless one understands and accepts a lot of preliminary theory already - and this theory presupposes already a particular point of view on what is physically real. We will see this in much more detail as we go along in this course. Thus the 'categorization of the world' mentioned above, and a certain theoretical framework built on top of it, is already there before one can even talk meaningfully about an experiment. Experiments are simply operations in the real world as well, and therefore, in our thinking at least, they are necessarily a subsidiary part of this framework.

That this must be the case was apparently clear to Democritus but perhaps less so to Plato. Democritus reckoned our perceptual and mental apparatus to be connected, and to be simply another complex construction form the

atoms. From this he drew the conclusion that our thinking and perception were necessarily limited and imperfect. This conclusion he would presumably have applied to our rational thinking as well - and so would have been forced to the conclusion that our ideas about "Forms" were just as limited as our perceptions.

If we accept this point of view, then it seems fairly clear that we are driven to the conclusion that ideas like "Circle", and the very idea that circles exist more or less approximately in Nature, are logically contingent on some accidental limiting characteristics of our perceptual/mental apparatus. There is then no reason to suppose that such entities exist - it is merely a way humans have invented to interpret the world. This argument suggests that all of mathematics and logic is nothing but some human invention.

And yet many mathematicians would disagree - their point if view is more Platonic, and they feel that they really are *discovering* things when doing mathematics, not inventing them. This argument is complex. Note that even if we do accept the argument above, we are still assuming that there is some "Reality" there, that we are part of, and that we are imperfectly aware of, and trying to discover. We shall be returning again to all of this.

Consider now the second question - whether one can derive or otherwise verify the Theory of Forms. Again, a modern discussion of this would lean heavily on our more sophisticated understanding of language and logic. Certainly we would still make the distinction between particular instances of, eg., a horse, and the general category of horses - but the way this is done now is rather different. In modern formal logic one would simply start by defining the set of all horses, and discuss this set as a formal object in itself. Then a 'derivation' of the theory of forms would take us into the discussion of how formal set theory is constructed, and how theorems in set theory are derived. Without going into this at all, I simply remark here that while these discussions may not seem to have any relevance to physics at all, yet again we will see that in the context of modern physics (particulary quantum physics) we will have to think about them again.

Curiously - and this would no doubt have upset Plato - modern physics, which is very heavily tied up with mathematics, has brought the idea of a *derivation* of ideas in mathematics somewhat closer to physics. This is because nowadays, our description of the world is very complex mathematically - and the most important entities in modern physics, like fields, or the spacetime metric, or the quantum probability amplitude, or not in any way observable directly, even in principle. They are simply abstract entitites, characterized mathematically. But this does **not** make them like Plato's Forms, simply because we can find out about them, by using their behaviour (characterized mathematically) to make predictions about the real world of appearances, and then compare these to experiment. The connection between these "forms' and the real world of appearances is also embodied in the theory - in fact the real world, including ourselves, is built out of these entities. This is fundamentally different from Plato - who, as we already discussed in (1) and (2) above, was not clear on how Forms related to the world of appearances.

(4) The Ontological Status of Forms: A serious objection that can be raised against Plato is that he is making a rather important assumption in his theory, which is that if we can talk about a general property like 'squareness', there must always be an *object* corresponding to this property, to which the general concept of squareness must be referred. This assumption is crucial to the theory of Forms: he assumes that there must be a "Square" Form, in the world of Forms, to which particular approximate squares in our world are related. There are 2 obvious objections to this assumption, viz.,

(i) Just because we have some quality, does not mean that there must be an object to which we must refer in defining it. Thus if we say that certain things are 'heavy', it is in no way clear that there must be some "Heavy', or 'heaviness', or even 'Weight', from which the heaviness or weight of given objects is defined. To summarize- there is no obvious reason why qualities have to be converted to special 'objects' called Forms. One might say that Plato is making an elementary confusion between 2 categories, of objects and qualities (ie., he is assuming that all adjectives must have a corresponding noun).

(ii) Even if one is prepared to accept that to all qualities and other sorts of abstract concept there must be a corresponding object, or 'Form', there is another hidden assumption, viz., that just because we can conceive of, or discuss something, it must thereby exist. This is certainly not obvious. For example, do the objects in a hallucinatory experience exist? To recall the example of Bertrand Russell, does the 'King of France' exist? One can clearly conceive of many things (unicorns, etc.) that nowhere exist in the universe. Now if we accept that the existence of an 'idea' in someone's head does not necessarily imply that there is anything existing anywhere, in any realm, to which this corresponds, then one can surely argue that Plato is wrong to assert that the existence of 'circles' in the real world implies a 'Circle' in a higher realm of Forms.

Remarks: It is not obvious how Plato would have treated the first objection here- again, it turns to a great extent

on the grammatical structure of language and on our notion of logic. One suspects that Plato would have fairly quickly dealt with the second objection, as follows. Again, the fact that, eg., no *real* unicorn exists is irrelevant to his argument- for Plato, one can easily have a Form with no exemplars in the 'real' world. Not only is no contradiction involved, this is actually a fairly natural consequence of his idea that the real world is a highly imperfect, 'dumbed down' correspondent to the world of Forms. However, he would argue, if we can conceive of or imagine something, then the only possible way that this can be is if the properties or qualities of the imagined object refer to some ideal qualities in the world of Forms.

Let me finish by remarking that whatever one might think about the dichotomy introduced by the Greeks, between the perceived world that we know, and the abstract world (of Forms, or some other intangible objects or entities of which we can have no direct awareness), it is here to stay- it is so deeply ingrained now in our view of the world that it is hard to imagine how to proceed without it. It is even deeply embodied in modern physics. However, as we shall see in this course, how we view this dichotomy has changed enormously since then.