PLATO'S COSMIC TELEOLOGY

A critical notice of Thomas Kjeller Johansen, *Plato's Natural Philosophy. A Study of the* Timaeus-Critias, Cambridge University Press, Cambridge, 2004

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As has often been remarked, the last fifteen years have brought a renewed interest in the Timaeus, resulting in a proliferation of conferences and publications. Thomas Kjeller Johansen's book has a unique standing in this trend because it dares to come up with a unified, comprehensive treatment of the dialogue. It needs strong intellectual discipline not to get caught up in the innumerable enigmas of the Platonic text and the intricacies of competing modern interpretations – and Johansen (henceforth J.) displays this remarkable virtue. But economy can become one of the great assets of this book precisely because it comes with a sense of comprehensiveness. I. manages to formulate questions that go to the heart of the problems and to suggest solutions which, one has the feeling, could be developed and applied to details that remain untouched in the book. The ensuing general picture represents well some current interpretative trends, but J. is also able to offer new insights in the discussion of age-old debates and even to come up with new questions. In what follows I shall go through the individual chapters of the book systematically, without however being able to do justice to all the interesting points raised by J.

The first chapter, 'What is the *Timaeus-Critias* about?', aims to show the fundamental unity of the work by arguing that the respective narratives of Critias and Timaeus, together with Socrates' depiction of the well-organized city on the previous day, develop different aspects of a single project. Since the original 'job description' of the guardians of the just city as described by Socrates includes the defence of the city in face of external powers, but Socrates (also in the *Republic*) only concentrate on their functions in maintaining the internal order of the city, we are naturally interested in seeing them in wars with other cities as well. The issue is all the more pressing as there is an authoritative view, maintained among others by Thucydides, according to which justice and virtue are present and relevant only in time of peace. In the social and psychological upheavals in the state of war human nature shows 'its true colours' (Thuc.

III.84): it becomes evident that human beings are by nature destructive, unable to control passions and strive for more than their due $(\pi\lambda\epsilon\sigma\nu\epsilon\xii\alpha)$. On the interpretation offered by J., Plato's task in the Timaeus-Critias is double. First, he has to demonstrate that justice does not merely make the individual and the society happy in peace, but that a just city can also prevail in a fight against an unjust enemy. Second, he has to prove that injustice, unbridled greed and aggression do not reveal the true nature of a human being, but are deviations from the natural state. The first task is fulfilled by Critias' narrative in which we learn that Atlantis, which shows all the characteristics of injustice, greed and $\pi\lambda\epsilon$ ove $\xi(\alpha)$, is doomed to fail in face of the just and virtuous Athenians. The second task, J. argues, is carried out by Timaeus who shows, in accordance with what Socrates intimates already in the Gorgias (508A), that human nature is embedded in the cosmos and that the same causal principles always aiming at the best are operative in both the cosmos and human beings. We can learn from Timaeus that due to the goodness of the demiurge, 'is' and 'ought' actually corresponds in the cosmos. The ultimate aim, however, is to show that the 'is' of the cosmos is also the 'ought' of human beings.

J. presents here a rich and convincing analysis of the overarching project of the dialogues. I have two little quibbles, both are in a way answered by later chapters of the book – perhaps forward references would have been helpful.¹ First, that J. does not lay more stress on the role of the strong structural isomorphism between the human being (or her rational soul) and its cosmic counterpart already at this point. For, from the fact that the world is good because it is well-ordered and displays mathematical proportions, it does not immediately follow that the human being should take the world's 'is' to be her 'ought' even on realizing that the same causal principles are responsible for the creation of both the cosmos and human beings. Incidentally, this point could strengthen the connections with the Republic. In the Republic isomorphism between the three parts of the soul on the one hand, and the three classes of the city enabled us to make inferences from the one to the other, whereas in the *Timaeus* it is the assumed isomorphism between the structure of the world soul and the structure of the rational soul which enables inferences from the cosmos' 'is' to the human soul's 'ought'.

¹ It also applies to some minor points. For example on p. 11 J. says that '[t]he figure of Hermocrates serves as a reminder of the Peloponnesian War and the downfall of imperialist greed' without providing any information on the historical Hermocrates. J. tells the reader what is important to know about the historical figure only in the last chapter (p. 184), with a backward reference.

My other quibble is that in order to show the contrast with the Thucydides-Callicles type of view on human nature, J. seems to overemphasize the teleological aspect of human nature in the *Timaeus* and to treat the disorder in human beings as $\pi\alpha\rho\dot{\alpha}$ $\phi\dot{\nu}\sigma\nu$. It is of course true – and J. will well expound it in later chapters - that the demiurge and the lesser gods created humans to be as good and well-ordered as possible. Yet, on the other hand, the 'Cradle Argument' at 43Aff, also indicates that there is a *natural* tendency in human beings for the disruption of the original order and proportion. It is also true that the morbid states of body and soul at 81E-82B are described as the results of $\pi\alpha\rho\dot{\alpha}$ $\phi\dot{\nu}\sigma\nu$ behaviour of the constitutive elements. Yet these occurrences are 'encoded' in the way the human body is built and in the way it has to interact with its environment - the human body has a *natural* propensity to get into these states. The human soul and the human body need constant attention and care to remain in a good and well-ordered state, for otherwise, paradoxically, they naturally fall into the $\pi\alpha\rho\dot{\alpha}$ $\phi\dot{\nu}\sigma\nu$ states of disorder and lack of proportion.

Chapter 2, called 'The status of the Atlantis story', carries on the interpretation of the project of the *Timaeus-Critias* in relation to the *Republic* and offers an answer to the 'history or fiction?' question from this perspective. At the beginning of the *Timaeus*, Socrates compares his wish to see the citizens of the just city in action to the state of someone who desires to see the beautiful figures of a painting in motion. J. connects this image to Republic 472D-E, where Socrates points out in defence of his depiction of the just city that it does not affect our assessment of the painter whether or not the depicted beautiful figures can in fact come into being. Being in motion does not make these depicted figures any more 'real' or 'historical'. I. continues by providing a concise but keen analysis of the complex relationship between 'truth', 'history' and 'fiction' in the framework of the *Republic*. The 'factuality' of a narrative on this account does not depend on the question whether or not it describes events that actually happened, but depends on the question whether it reveals some fundamental truth about the world. On the other hand, a story that recounts events that actually happened may be completely irrelevant when it does not teach us anything important about the world. Following Burnyeat's study on the status of imitative poetry, J. stresses that *Republic* X, all the strong strictures notwithstanding, allows into the city 'hymns to the gods and encomia of good men' (607A) and points out that what Socrates asks for at the beginning of the Timaeus is exactly an encomium of good men in action, and this is exactly what he gets from the imitative stories (cf. 175B5-7) of Critias and Timaeus. Moreover, Socrates' distinction between the broader class of 'imitative ἔθνος'

and the $\gamma \acute{\epsilon} vo\varsigma$ of the poets at *Tim*. 19D-E may be read as an attempt to carve out a niche for the speakers of the *Timaeus*, who in contrast to the poets, do have the philosophical knowledge and experience in statesmanship required for the creation of the right kind of edifying imitative narratives.

But what about, then, of Critias' repeated claims that what he presents is a historical account? J. lists a number of indications that this should not be taken at face value. First, it is by an illocutionary act that Critias identifies the characters of his story with the citizens of Socrates' ideal city. It is, furthermore, fully in line with the general tendency of the Athenians to idealize their past. Moreover, the story has reached us through the Egyptians, and J. reminds us that this fact in itself should raise our suspicion, because of the well-documented stereotype that the Egyptian stories, just as the tales of the Pheonicians, are knavish and deceitful. The contrast between the emphasis on rigorous historical method and the lack of it may also be taken as a pointer to the fact that Critias' story is nothing but invention. But, why does Critias still harp on the historicity of the account? J. refers here to the 'noble lies' of the *Republic* and in particular to the myth of the three metals (*Rep.* 389B and 414B-C). The teller of these stories knows perfectly well that they are not descriptions of actual historical facts, but puts them in the distant past in order to induce the belief that such things are possible, even if not under the present conditions.

J's interpretation, once again, is instructive, interesting and largely convincing. What I would have liked him to say more about is the use of such stories in the specific dramatic setting of the Timaeus-Critias. For it seems that the parallels drawn from the *Republic* focus on the stories that people possessing philosophical knowledge may tell to the less knowledgeable in order to persuade them for the good of the city. But if we agree with J. that all the participants of the discussion of the Timaeus-Critias possess the required philosophical knowledge (cf. p. 33), why do they still use such noble lies among each other? Why does Critias feel it necessary to stress to his present interlocutors the historicity of an account he knows well is pure invention? Does it have something to do with the 'feast' of speeches, so that this is how people of high intellectual standing entertain each other, with a touch of playfulness? Or is it the case that Critias is, so to speak, aware of the fact that he is 'on record' and while the pointers J. lists are his signals to his philosophical audience, he does not reveal that he has just made the whole story up, because he knows that also non-philosophers will read Plato's text? Or can't it be that after all Critias (and possibly also Hermocrates) is not so much of a philosopher, and that it was Solon who, in accordance with the policy announced in the Republic, created the noble lie – which worked because his audience accepted it as historical and transmitted it so?

Chapter Three, 'The status of Timaeus' account', is a natural continuation of the project of the first two chapters. It contains two parts of unequal length. The first 17 pages deal with what $\varepsilon i \kappa \omega \varsigma$ means in the $\varepsilon i \kappa \omega \varsigma$ $\mu 0 \theta 0 \varsigma$ / $\varepsilon i \kappa \omega \varsigma$ $\lambda \delta \gamma 0 \varsigma$ construction, and what is, if any, the difference between $\mu 0 \theta 0 \varsigma$ and $\lambda \delta \gamma 0 \varsigma$ in this context. This is followed by a shorter discussion on how Timaeus' $\varepsilon i \kappa \omega \varsigma$ $\mu 0 \theta 0 \varsigma$ relates to what we have seen in the previous chapter about the connections between the *Republic* and Critias' narrative. Let me start with summarizing this last part with which I find myself in complete agreement. J. argues that Timaeus' story, just as Critias', is of the type that should be allowed into Socrates' city, the difference being that while the Atlantis narrative offers an encomium of good men, Timaeus' cosmology is such that it can help the citizens in forming a correct conception of the goodness of the god(s). And, just as the Atlantis story, Timaeus' account of the creation of the cosmos is not an 'historical' narrative, but is a fiction that builds on the fundamental truths about its characters and subject matter.

Let us turn now to the thornier issue of the εἰκὼς λόγος / εἰκὼς μῦθος. J. presents here an ingenious, and as far as I am aware, original interpretation of this notorious problem. J. argues, first, that the account of an image qua image must explain the features of the image as they represent the relevant features of the original. He then continues by explaining that the account of the cosmos can be only a likely account because in this case the creation of the image involves a transfer of properties from one ontological domain to another. For example the non-spatial feature of the paradigm that it is complete and encompasses all the intelligible animals is represented in the cosmos by the spatial feature of sphericity. Similarly, the eternity of the paradigm becomes time when transferred to the moving and created cosmos. Because of the ontological differences between the model and the image, property E of the model becomes property F that only resembles or has only an analogical relationship to E, whereas when there is no such ontological difference, the same property F can be in both model and image. If we now apply what we have just said about the account of an image *qua* image – that it has to explain features of the image with reference to the relevant features of the model - the explanation of F in terms of E will be analogical at best. Time in the cosmos is like eternity in the model and the sphericity of the cosmos is like the allencompassing completeness of the model. Such an explanation functions as the analogy of the Sun in the Republic, which is clearly presented as falling short of a strict demonstration.

One issue that J's interpretation immediately raises is the connection with what we read for example in the *Phaedo* about giving an account of property

F of a particular with reference to the relevant Form F. Is it the case that the transfer from one ontological domain to another of any property involves such basic differences like the difference between eternity and time? If that is the case, then it turns out that we can give an account of the F of the particular only in terms of the Form E. Or is it rather the case that the two examples, the temporal nature and the spatial form of the cosmos, are special cases from which we cannot make general statements about the transfers from one ontological domain to another?

There is a further related issue. J. wants to separate the epistemological restrictions on Timaeus' account from the fact that the cosmos is in the sphere of becoming: the restriction on Timaeus' account is the joint effect of the likeness relationship *and* the transposition of properties between different domains. But then the relationship remains unclear between the epistemological restrictions concerning the knowledge of *all* becoming things that Timaeus announces in his second distinction in 28A1–4 on the one hand, and the epistemological restrictions concerning the account of such likenesses the model of which belongs in a different ontological domain. Besides, it seems to me questionable that one could give an epistemologically stronger account of a painting than the cosmos because the painting has a model that belongs to the same ontological domain.

The next three chapters again form a unit in so far as they discuss respectively three fundamental concepts of the *Timaeus*: the demiurge, necessity, and the $\chi \acute{\omega} \rho \alpha$. Chapter 4, 'Teleology and craftsmanship', concentrates on the causal role of the demiurge. The main thrust of the chapter is to assess Timaeus' teleology in comparison with Aristotelian teleology. J.'s main thesis is double. First, he argues that the demiurge, understood as an intelligent external and possibly personal cause, cannot be read out of Timaeus' cosmology and, second, that Timaeus' account can be interpreted so that it does not involve reference to volitional and other psychological factors. The first point marks a difference with Aristotle, while in respect of the second, Plato and Aristotle are not that far from each other.

It is commonly assumed, and it is a starting point of J.'s discussion, that Aristotelian natural teleology is 'simpler' than the one that works with an external cause. My first quibble concerns this starting point. No doubt, natural teleology is ontologically simpler, because it does not need to posit a further entity external to the cosmos. Yet, whether or not it is also explanatorily simpler depends, I think, on which type of natural teleology we are dealing with. For natural teleology is simpler in terms of explanation only if there is a single cause of the order of the whole and the parts of the whole. If, however, we have

to posit independent organizing principles for every being or type of being in the cosmos, plus something that explains their ordered interrelation, we get a multitude of organizing principles, and we still do not know why is it so that all the entities and types of entities contain such an internal organizing principle. Thus, not all current interpretations of Aristotle allows us to say without any further that his teleology is simpler than that of the *Timaeus*. This quibble aside, I's interpretation comes out as a reasonable and persuasive middle ground between two interpretative trends, one which treats the demiurge as a full-fledged personal creator god reminiscent of the God of Genesis, and another which tries to reduce the demiurge to one of the other explanatory principles of Timaeus' account. To my mind, the alternative taken by J. is by far the most appealing and I find most of J's arguments convincing. For instance, the arguments he lists to the effect that the demiurge cannot be identified with the world soul should be definitive. Most importantly, the sentence '[the world soull has come to be as the best of the things generated by the best of the ever-being intelligibles' (36E6-37A2) explicitly states that the demiurge and the world soul belong to two different ontological domains, and one is created by the other, and this should immediately rule out any attempt at their identification.

The other way to dispose of the demiurge is to collapse it into the paradigm. The main textual support for such a view is that at 50C-D Timaeus lists only three kinds ($\gamma \dot{\epsilon} \nu \eta$): 'At present, then, we need to distinguish three kinds: what comes into being, that in which it comes into being, and that from which what comes into being arises by being imitated. Moreover, it is proper to liken what receives to a mother, that from which to a father, and the nature in between these to an offspring...'. The problem is that even though the demiurge has previously been called the 'father' (e.g. 37C, 41A), in this sentence the 'father' seems to be the paradigm. J. argues that the demiurge is not mentioned in this list because the passage describes the pre-cosmic state, and at this stage the demiurge is not as yet an explanatory principle; the model is termed 'father' in so far as the shadows of the elements in the pre-cosmic state still somehow imitate the model.

I am not entirely convinced that we need to make this restriction. First, I am not sure that the phrase $\dot{\epsilon}v$ δ' $o\ddot{v}v$ $\tau\ddot{\varphi}$ $\pi\alpha\rho\acute{o}v\tau_{\rm I}$ is very apt to refer back to the pre-cosmic state. More importantly, the three-fold division explicitly refers to the original two-fold division of the proem, in which the demiurge does not figure as a separate item either. If the original division is complete, the demiurge should fall into the same class as the paradigm, without however being identified with it. The passage, quoted above, which says that the demiurge is 'the best of

the ever-being intelligibles, only strengthens this view. If so, the $\gamma \acute{\epsilon} vo\varsigma$ that is described as 'that from which what comes into being arises by being imitated' need not refer only to the paradigm, but to the whole class that includes both the paradigm and the demiurge. And I don't find it too problematic to call this complex of formal *and* efficient causes 'the father'.

Having secured the place of the demiurge in the story, J. seeks to show that the presence of the demiurge does not imply that the account involves *personal* desires and intentions. J. suggests that the series of deliberative and creative acts performed by the demiurge are governed not by his individual preferences and intentions, but by the internal logic of his craft, which he puts into practice in the most perfect way. Moreover, J. can cite passages from e.g. the *Republic* where benevolence is taken to be a feature of the craft itself and not that of the craftsman. If so, the benevolence of the demiurge turns up a further aspect of his art and not part of his psychological profile. The proposed interpretation nevertheless seems to downplay Timaeus' emphasis on the goodness of the demiurge. It may be going too far to say that the goodness of the demiurge may be reduced to, or fully determined by, the fact that he is a perfect instantiation of his craft. And it would have been interesting to see whether, and if so how, this interpretation can distinguish the respective roles of the demiurge and the lesser gods.

The final part of the chapter considers the vexed issue of the literal versus metaphorical interpretation of the creation story. J. acknowledges the force of the arguments on both sides, and tries to find an interpretation that does justice to both. He stresses, more than most current interpreters, that one can eliminate the temporal priority of the pre-cosmic chaos only by forcing the text. On the other hand, he agrees that the Parmenidean question of 'why then and not earlier or later?' remains a serious problem for the literal interpretation. The solution he tentatively suggests is that the cosmos was never created first, but since it has a tendency to become disorderly without divine intervention, so the demiurge steps in and creates order anew whenever it is necessary. Creation comes after disorder, but there is no first state of disorder, just as there is no first act of creation. There certainly are indications in both the Timaeus and other Platonic texts that J. does not mention but could support his reading, such as the puzzling expression 'traces' of the elements, which may intimate that they were once there already, or the myth of the *Politicus*. On the other hand, are we to imagine, for example, that the demiurge has to re-create each time the elements from the bare traces of elements and the soul from the original unmixed ingredients of the soul? But then what about remarks stating that what the demiurge created, such as the elements and the soul, could only be undone by the demiurge himself (32c and 41A-B)? Because of the interest of the proposal, more engagement with this and further problems would have been welcome.

Chapter 5, 'Necessity and teleology', continues the examination of Timaeus' causal and explanatory framework by focusing on 'necessity' in its relation to demiurgic activity. J. first argues that the wandering cause does not introduce any causal indeterminacy into the physical processes; 'wandering' here simply means lacking a definite goal or aim. Necessity is a wandering cause when it is not working for a teleological end, whereas it is a contributory cause ($\sigma \nu \nu \alpha \iota \tau i \alpha$) when it is integrated into teleology. After this initial clarification in line with some recent interpretations, J. continues by arguing that necessity itself is a product of creation in so far as the regular and determinate processes governed by necessity can only emerge when there are entities with fixed and well-defined characters, while in the pre-cosmic chaos there are no such entities. The principle of 'like-to-like' is already there in the pre-cosmic chaos, but only as a tendency and not as a full-fledged function of necessity, because the traces of the elements are not sufficiently well-defined for necessity to operate on them.

That necessity is an outcome of the divine design is important, further, because this makes it possible for necessity to be 'persuaded willingly' by reason. That necessity is persuaded willingly does not mean that we should attribute any psychological features to it, but simply that the demiurge can make use of the elements' own natures – and this is guaranteed by the fact that the elements themselves are the outcome of the demiurge's productive activity. Yet the elements and bodies show fixed sets of properties, and only some of these enter into the purposeful functioning of a created thing; other properties that necessarily accompany these may impose some adverse effects. This is the limitation necessity imposes on teleology. The skull's thinness is good for intelligence, but it is necessarily accompanied by the disadvantageous fact that it is more fragile (75A–c).

After a helpful comparison with the *Phaedo*'s account of causation, J. continues by maintaining that to spell out the principal, teleological, cause, it is not sufficient to specify the greatest good a thing produces, but we need to express it with reference to god's intentions, and that this marks a difference as compared to Aristotelian teleology. We are thus back to the issues dealt with in chapter 4, but with a significant shift of emphasis. J. points out in a footnote that this conclusion 'should be quite compatible' with what we read in the previous chapter. But I have to admit that the slight unease I felt at the end of the previous chapter only got stronger when I read this. If the craft is the

causally more relevant factor, why is it that Timaeus does not say that the cause of X is that it was produced by perfect craftsmanship, but that it was produced from divine forethought and goodness?

The last section of the chapter examines in more detail the case of vision, where we can see most clearly the way the principal cause determines the working of the contributory cause. J.'s main focus here is the relationship between the fire of the eye and the light emitted by the sun. His analysis of this much-discussed passage is full of fine and, at least to my mind, novel observations, including analyses of literary allusions and significant word plays.

Chapter 6 bears the title 'Space and motion' and examines the way the $\chi \acute{\omega} \rho \alpha$ and becoming are related. J. starts by saying that it has been debated since antiquity whether the $\chi \acute{\omega} \rho \alpha$ is space or matter. He then, somewhat unexpectedly, does not continue by examining that very question, but states that he will focus on the spatial aspect of the $\chi \acute{\omega} \rho \alpha$ and show its relevance to Timaeus' overall cosmology.

He first points to the fact that Timaeus' language of coming-into-being is inherently tied up with spatial terms: 'entering into,' 'appearing in' and 'perishing out of'. The recognition of this link leads to formulating the central problem of the chapter and to the suggested solution which, in a nutshell, is this. Coming-into-being and qualitative changes are explained by Timaeus at the basic level of analysis as the locomotion of the elementary triangles: the triangles move around and temporarily compose the geometrical bodies of the elements, which in turn, compose phenomenal bodies, while their reorganization explain the qualitative changes of these bodies. Coming-into-being and qualitative changes thus need a space in which the triangles can move around, and this function is provided by the $\chi \acute{\omega} \rho \alpha$.

A crucial step in J.'s interpretation is to clarify the way Timaeus links locomotion and coming-into-being of bodies composed of the elementary triangles. To use an analogy slightly different from the one used by J., imagine that the letter T appears on your computer screen against a white background. Now imagine that in the next moment what you see is a T slightly to the left of the original T. You can describe what happened in two ways. By attributing a certain measure of independent existence to the T, you can say that the T has moved to the left. Or you can say that the T comes-into-being, or enters your screen, when the relevant pixels turn black and ceases to be, or leaves your screen, when the black pixels turn white again. According to this latter description, it is a different T that comes into being, or enters your screen, when pixels slightly to the left of the original ones turn black. J. argues that Timaeus is primarily interested

in this second type of description, and this is how he links locomotion and coming-into-being.

J's analyses and conclusions are once again interesting and thought provoking. Yet shunning a more direct engagement with the space-matter problem - or, for that matter, showing in what way these concepts are inappropriate to approach the $\chi \dot{\omega} \rho \alpha$ - ultimately leaves the reader with a somewhat imbalanced view that focuses only on one side of Timaeus' terms and metaphors. Ultimately we are not faced with the problem why the gold, in which the shapes appear, and the base of the fragrant ointments are more suitable metaphors than, say, a box containing balls. And, clearly, one would need some help to connect the spatial or place-like nature of the $\gamma \omega \rho \alpha$ with the view that it is moved by and moves the simple bodies. The space-matter problem, furthermore, seems to come back in the next chapter, where J., I think correctly, emphasizes that the soul has spatial extension. He then tries to pin down the difference between body and soul by reference to specific spatial properties of bodies, such as depth and 'thickness'. But one could still ask that if the $\gamma \dot{\omega} \rho \alpha$ is place or space, and the soul also has three-dimensional spatial extension, why is it that the $\gamma \dot{\omega} \rho \alpha$ remains explanatory only in relation to the triangles, elements and bodies and does not seem to have much to do with the soul? Finally, given the main conclusion of the chapter concerning the explanation of the coming-into-being and qualitative changes of phenomenal bodies as the reconfiguration of permanent components at the basic level, the comparison with Aristotle at the end of the chapter could have been usefully supplemented with some reference to the atomist view.

The next chapter, 'Body, soul, and tripartition', continues the project of chapter five in analyzing the way necessity can be put into the use of teleology focusing now on the soul-body interaction. The chapter starts with a discussion of the world soul. Having pointed out that movement and thinking are intrinsically connected in the world soul, I. proceeds by expressing his agreement with those recent interpreters who have emphasized that the soul has spatial extension. In a further move, he suggests that the fact that both soul and body are spatially extended and move in space should be the key to understand why psychophysical interaction is not a problem for Timaeus. (To which I would also add the ontological composition of the soul.) The central section of the chapter then analyzes the two types of necessity, as they have been distinguished in chapter five, within the human being. Given that the two lower parts of the soul and the human body are also created by gods - even if not by the demiurge - what role can we assign to necessity as a contributory cause, and what remains the effect of simple necessity, untamed by reason? Once embodied, the motions of the circles of the rational soul are exposed to the linear motions coming from the outside. These motions can disrupt the regularity of the natural motions of the rational soul, because the complex motions of the circles of the different are not necessarily co-ordinated by the circle of the same. This much is a matter of simple necessity. Yet, the lesser gods construct the body and the lower parts of the soul so that these destructive effects get minimized, and in so far as they are using bodily parts for this purpose, they are enlisting necessity as a contributory cause for our good. The lesser gods construct human anatomy along two principles. First, properly to separate the seats of different bodily and psychic functions, and most of all to protect the rational soul from violent bodily affections, and, second, to make the communication among the different parts possible, and most of all, that the massages of the rational soul can reach the lower parts of the body. The marrow has a crucial role in providing separation and communication because being both circular and elongated, it can function as an interface between the circular rational motions and the linear motions characteristic of the body. The result is that, given some basic necessary conditions stemming from embodiment, much of what is bodily in us actually serves our good – even appetite in so far as it helps the maintenance of the body. The chapter rounds off by highlighting the specificity of Timaeus' conception of the soul-body relationship against the views expounded in the other main dialogues that treat this question (Phaedo, Republic, Phaedrus).

The next chapter called 'Perception and cosmology' brings together and develops themes already dealt with in chapters 3 and 5 on the status of Timaeus' account and the teleological role of perception respectively. The first part of the chapter – which could have just as well found its place in chapter 3 – turns back to Timaeus' proem. J. argues against Cornford (and others) that it is problematic to classify the object of natural philosophy simply in the sphere of becoming, with the implication that it can be discovered only by belief with sense perception. For the physical world is not only the image of an intelligible paradigm, but the construction of the world as a whole and the individual parts of it was a fundamentally mathematical project. Thus, if one can refer to the more finely grained distinctions of the divided line than the binary scheme of Timaeus' proem, one would be inclined to set the place of natural philosophy in the study of the relationship between mathematical objects and sense particulars.

The main bulk of the chapter then concerns the role of perception in the cognitive process that through the observation of heavenly motions leads to the 'invention of number' and ultimately to philosophy. Having clarified (somewhat in the vein of Dominic Scott's Recollection and Experience) that the difference between empiricism and rationalism is rather a question of degrees, J. orchestrates a dialogue between two alternative readings à la Burnyeat. Interpretation A is more empiricist and maintains that, according to Timaeus, empirical observation provides us with the basic concepts of mathematics, while it remains to reason to process the input by analysis and calculation. According to Interpretation B, by contrast, perception cannot provide even the basic concepts, but only the stimuli that can put to work the concepts that reason already has – but for this causal role, we do need perception. The debate between the two Interpretations involves fine points about the nature and status of δόξ α and the possible role of recollection in the *Timaeus*. I. ultimately and somewhat tentatively sides with Interpretation B, which is still sufficient to give content to Timaeus' remarks about the teleological role of perception.

One possible query is how far can we generalize about Timaeus' empiricism from the case of astronomical observation. For when we are observing the celestial motions, we are doing exactly that for which we were given eyes. But how much will this case tell us about the cognitive role of perception when we are observing a different set of objects with the aim of acquiring knowledge about them? This is even more so because in observing the heavenly motions, as J. emphasizes, we are studying the visible manifestation of the structure and functioning of the cosmic counterpart of our rational souls. But can perception have the same role when we are observing, say, a crystal, which, after all is ultimately composed of geometrical bodies and triangles? And what is the role of perception in analyzing colours?

The last chapter creates a nice frame with chapter 1 in so far as it returns to the general scheme of the speeches delivered by Socrates, Critias, and Timaeus, focusing here more on the literary format. The central question is why do long speeches, as opposed to dialogue, take up most of the Timaeus-Critias. J. first specifies that Platonic dialogues are dialogues at multiple levels, and that the Timaeus-Critias remains a dialogue at some of these – but the special status of this work still remains for the main speakers deliver long speeches censured by Socrates in other dialogues. He then continues by listing some suggested explanations (that the speeches are encomia; that they are myth; and that the Timaeus-Critias only brings to the extreme a general tendency of Plato's later period) and states why he finds them insufficient. In the positive part, he first calls attention to the importance of reciprocity in the way the characters deliver and receive speeches. It is a striking thought that Socrates constructed his city in a similar monologue on the previous day. I wonder if he could not retain his preferred mode of exposition – as he does it in the *Symposium* – even when the others reciprocate in continuous speeches.

It might have been expected that J. connects his answer to what we have learned in the first chapter somewhat along the following lines. In so far as the speeches delivered by Critias and Timaeus should, according to the prescriptions of the Republic, present correct forms of imitative narratives, commendable alternatives to the untruthful stories of the poets, they need to take the form of continuous stories and not dialectical discussions. I's central thesis in this chapter, however, is that Timaeus' subject matter requires the monologue format: a proportionate, well-ordered, complete speech is the appropriate way to speak about the proportionate, well-ordered, complete creation of the demiurge. Timaeus applies what J. terms 'the teleological criteria of composition. He wants to be, as it were, the demiurge of his own speech; but being a human, he occasionally needs also to correct himself. The point is supported by close readings of Timaeus' programmatic statements and reflections about his own speech. But what about Critias, then? He also wants to apply the same compositional principles, for mutatis mutandis they are applicable to his subject matter as well. But after the promising first sketch, he ultimately fails to reciprocate the proportionate and complete speeches of the others – the *Critias* is anything but complete. According to J.'s final suggestion, this may be Plato's way of expressing his reservations about the person (perhaps to be identified with the tyrant of the same name) and the political culture he is a child of.

Johansen's book is a remarkable achievement. The presentation of the arguments is consistently clear and crisp, and interim conclusions make the

work user-friendly.² The result is a philosophically inspired and engaging book suitable equally for those who are struggling their way through the *Timaeus* for the first time and for those who are already saturated with the ever-growing scholarly literature.

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A few formal points: I have spotted only a handful of typos, none of which makes understanding difficult. J. quotes different translations, Cornford's, Zeyl's and his own, and the translations of some key terms are not always in harmony. It also happens that J. prints Cornford's translation unmodified, but indicates that it is 'with alterations' (e.g. on p. 188), and it is not always clear whose translation we are reading (e.g. it is not evident that the translation on p. 161 is by Cornford). Sometimes he prints two different translations of the same phrase. To give some examples: 35A2 is translated as 'the being that comes to have parts in bodies' on p. 144 and as 'the being that becomes divided around bodies' on p. 138; the quote from 29B1–D3 on p. 161 does not include the modifications J. introduces to the same translation on pp. 49–50; and he quotes Cornford's translation of 47A1–B2 with different modifications on p. 107 and 165.