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The *Timaeus* and the "Longer Way"

"God-Given" Method and the Constitution of Elements and Animals

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This reflection begins from—and, I hope, lets flower—an old question: how, after Plato has "Parmenides" challenge the simile of form and sensible as "model" (παράδειγμα) and "likeness" in the *Parmenides*, can he have "Timaeus" make such unhesitating and fundamental use of it in the *Timaeus*?[1]

I will respond to this question in three stages. We will begin with some preparatory reflections on the simile and the rhetoric of the *Timaeus*. The simile, I will argue, has different strengths and liabilities, not surprisingly, for different potential readers; what makes it illuminating and helpful for someone only recently introduced to the metaphysics of forms may make it a hindrance to someone seeking to do them philosophical justice. We will find much in the rhetoric of the *Timaeus* to suggest that Plato aims the dialogue at a readership that is thoughtful and open but not philosophically educated, a readership that has not undertaken—to invoke two crucial metaphors from the *Republic*—the "longer way" (435D; 504C) that leads through the "turning of the soul" from Becoming to Being (518C). The simile of model/likeness will be helpful to such readers. By contrast, to one who is embarked on the "longer way," the simile may seem an obstacle, for it leaves unarticulated what in his philosophical education he chiefly seeks, the order of the forms as it is disclosed by dialectic. He will respond to the simile, accordingly, by trying to set it aside and to put in its place an account of this eidetic order. May we not assume that Plato foresaw and, indeed, wrote in the hope of receiving this response from those most committed to the longer way?

The only way to pursue this possibility is to become such readers ourselves. In §II we shall attempt this, albeit, of course, in a highly abbreviated way: I shall first retrace the path of the longer way, then try to reconstruct the vision of

eidetic order to which it leads by interpreting two key passages in the *Philebus*, the accounts Plato has Socrates give of the "god-given" method of dialectic and of the four kinds. Then in §III we will return to the *Timaeus*, reading it in the context of what we have learned from the *Philebus*. We will concentrate on two sets of passages in which Timaeus treats of forms as models, his accounts of the ordering of the four elements and of the fashioning of the various animals. Implicitly present and at work in each of these accounts, I will try to show, is the eidetic order that is disclosed by the god-given method of dialectic.

I. Preparatory Remarks on the Simile of Model/Likeness and the Intended Readership of the *Timaeus*

Let me begin by speaking against an oversimplified construal of my opening question. First of all, it is not the simile as such but a misunderstanding of it that Plato has Parmenides target.[2] Socrates need not have agreed that because a sensible, "resembling" (ἐοικέναι; *Parmenides* 132D3) and "made in the image" (εἰκασθῆναι; 132D4) of a form, is "similar" (ὅμοιον; 132D7) to it, the form must also be "similar" (ὅμοιον; 132D6) to the sensible.[3] It was accepting this last point that made Socrates vulnerable to the Third Man Argument. But he might have insisted on the difference in kind between a model (παράδειγμα) and its likeness (εἰκών), in effect agreeing in advance with Parmenides' conclusion, namely, that it is not "by similarity" (ὁμοιότητι; 133A5) that a sensible participates in a form, even while saving the simile from the reach of Parmenides' argument.

To this should be added the observation that in returning to the model/likeness simile in the *Timaeus*, Plato gives himself an occasion at once to secure this difference in kind and to explore an issue crucial to the physics, as it were, of the form/participant distinction. An image differs from its original by depending on some medium; thus, in the familiar cases in the *Republic*, shadows depend on the play of light on a surface, and reflections depend on water or whatever shiny, fine-grained surface bears them. Plato has Timaeus secure the difference in kind of forms from sensibles by calling attention to this dependence (51B–52D, especially 52C),[4] and in the process he gives himself occasion to develop the crucial notion of the "receptacle" (ὑποδοχή), the obscure medium that "receives" the "imprint" of the forms (50B–51B) and so lets sensibles be.

This metaphor of the reception of an imprint points to a second strength of the model/likeness simile. *Paradeigma* brings to mind the notions of pattern and design: that a thing be "made in the image of" something else implies that the latter is in some way the source of the thing's design. This is exactly what needs to be thought through—and, I will suggest shortly, what Plato does in fact think through in the *Parmenides* and the set of dialogues that are associated with it—if we are to do justice to the notion of forms as causes.

Given these strengths of the model/likeness simile, we might want to reverse our initial question, asking not why Plato resumes use of the simile in the *Timaeus* but why he challenged it in the first place. The answer, I think, is that the simile brings with it two significant dangers. First, by inviting us to draw on familiar sense-perceptual experience—on the sight of a thing and its shadow, for instance, or on the sight of a painter or sculptor studying a live model as he produces an image in paint or stone—it tempts us to betray the ontological priority it expresses; to depend on such analogies is to let sensible things serve as models in our understanding of forms. Succumbing to this temptation is the source not only of errors of commission (all the misunderstandings that Plato's Parmenides exposes in the youthful Socrates' notion of forms in the first part of the *Parmenides* fall under this heading) but also of a critical error of omission: settling for the understanding of form as like a sensible original, one will not attempt the "turning of the soul" from Becoming to Being (*Republic* 518Cff.), the suspension of one's normal "trust" (πίστις) in sense experience in order to develop concepts adequate to what precedes and is basic to sensibles, namely, the timeless Being of the forms. Yet this is the crucial educational undertaking for one who would enter into philosophy. Without such concepts, one can only assure oneself dogmatically and at the risk of self-deception that the model/likeness simile is not to be taken literally. When pressed, as Plato has his Parmenides press Socrates in the first part of the *Parmenides*, one will have no conceptual account with which to interpret the simile and, so, no means by which to free oneself from the sorts of misunderstanding to which Socrates falls prey. One can say to oneself (as we just have) that a form is different-in-kind from the sensibles that participate in it and as such is their design-principle, but one will lack the conceptual resources to explicate and give an account of these claims.

The second significant danger is closely related to the first. The simile of model/likeness focuses attention on a form's relation to its participants; this leaves unattended the different relation of forms to one another. This latter relation—the "communion" or "blending" that Plato introduces in the *Parmenides* and then explores at length in the *Sophist* and *Statesman*—is of crucial importance not only in itself but also (as I will try to indicate in §II) to our understanding of the very relation to which the simile points: the form's status as design-principle. Hence, to the extent that the simile tempts us not to pause to study the relations between forms, it tends to cut us off in advance from understanding its own content.

These strengths and dangers of the model/likeness simile suggest an interesting possibility for the interpretation of the *Timaeus*. On the one hand, the use of the simile gives the not, or not yet, philosophically educated reader a powerful first access to the strange notions of forms and their causal status. On the other hand, to achieve a philosophical understanding of these notions requires that one suspend the "trust" in sense experience that the simile leaves in play and—in order to make the "turn" from Becoming to Being—develop

abstract concepts to interpret the simile's content. Does Plato, having first used the simile to introduce the forms to the nonphilosopher, then challenged it to force the philosophical aspirant to deepen his understanding, now in resuming it intend to address both sorts of reader at once? He is confident, we can presume, that to the thoughtful but un-"turned" many the simile will seem self-sufficient and helpful. He also knows, surely, that the critically minded "few" who have heard and responded to his challenge of it, must now find his renewed use of it provocative; they will be moved to a rational reconstruction of its content, a rethinking that will draw on the conceptual resources generated in the course of making the turn. Does Plato, oriented by these anticipations, intend to speak—and aim to be heard—on both levels at once?[5]

That Plato aims at the thoughtful but un-"turned" many, we can affirm without hesitation. In a number of ways Plato signals that the *Timaeus* has as its readers of first intention[6] those who, while intellectually open, have not yet entered deeply into philosophy. Because my primary goal is to offer the beginnings of a reading of the dialogue as it might speak to those who *are* at work on the turn, I will restrict myself here to noting three features of Plato's rhetoric that indicate his intention, first, to address the unturned many:

1. *The restriction of Socrates' summary to the "shorter way."* By the introductory exchange between Socrates and Critias, Plato projects for the speeches to come a pointedly political-ethical character. Socrates sets the stage by reviewing "the main points" he made in their conversation the day before (*Timaeus* 17C–19A), and Timaeus confirms that this summary is full and exact (19B). All of these points are familiar from the *Republic*[7]—against the background of which, however, Socrates' list is strikingly selective. Plato has him recall all the salient *political* features of the just city as he constructed it in books 2–5 of the *Republic,* beginning with the separation of the guardians from the producers and the principle of one man/one job and then moving through the gymnastic and musical education of the guardians, their sharing of communal property and living conditions, the assignment of the same tasks and responsibilities to guardian women and men alike, the abolition of the private family, and the eugenic program to assure the best possible offspring. Conspicuously missing from this list is all that Socrates went on to propose in books 5–7 when, objecting a second time to Glaucon's complacent readiness to accept the tripartition of the soul, he introduced the longer way (*Republic* 504B–C, recalling 435D): thus the notion of the philosopher-king, the study of the Good, the project of the turning of the soul, and the study of the five mathematical disciplines as preparation for dialectical study of the forms all go unmentioned; so does the suggestion, itself conspicuously undeveloped in the *Republic,* that the tripartition of the city gives us at best an "imprecise" grasp of the structure of the soul (435C). The effect of these omissions is to isolate the political proposals of the *Republic* and to leave aside, in the consideration of their ethical and political value, the daunting task of providing them a metaphysical foundation.[8]
2. *Critias' innocence of metaphysics.* In giving Socrates Critias as his interlocutor, Plato reinforces this effect. Critias is both uncritical and innocent of metaphysics. Accepting enthusiastically Socrates' desire to "celebrate" (*Timaeus* 19D) his just city, Critias has no questions about whether Socrates' paradoxical construction is "the kind of political structure cities should have" (17C); he accepts without comment its normative status. To comply with Socrates' request to see this city put into motion and the context of action and struggle (19B), Critias proposes to identify it with the ancient Athens that, according to Egyptian historical records reported by Solon, heroically repelled the invasion of imperialist Atlantis "nine thousand years ago" (23E; also 27B). Socrates in the *Republic* had built his city feature by feature, reflecting on what excellence in a city requires; thus, to recall his figurative language in book 9, he had explicated "a model [that] is laid up in heaven" (ἐν οὐρανῷ . . . παράδειγμα ἀνάκειται; 592B2). Critias' figure of "nine thousand years" is idiomatic and has the force of placing Socrates' city in a primeval past, as remote from the present as possible. Thus his identification effectively translates into time, as the distinction between primeval past and the present, what in the *Republic* was the metaphysical distinction between the atemporal eidetic and the temporally determinate actual. Strikingly, Plato has Critias interpret this as the translation of what Socrates had presented "in mythical fashion" (ὡς ἐν μύθῳ; *Timaeus* 26C8) "into the realm of fact" (lit., "into the true"; ἐπὶ τἀληθές; 26D1), and even more strikingly, he has Socrates endorse this interpretation (26E). To this it should be added that Plato has Critias stress the potential popular appeal of the story of ancient Athens and Atlantis. Had Solon devoted himself to its telling, Critias reports his grandfather saying, he might have won greater fame than Homer and Hesiod (21D). And Critias marvels at the "childlike pleasure" the story gave him and the "indelible" impression it left on him when, as a young boy, he first heard it. As orienting remarks, these are all telling; they prepare us to receive in the discourse to come not critical inquiry, much less the sort of abstract reflection we get in texts like the *Parmenides* or the Eleatic dialogues, but rather a celebratory and imaginative immersion in *quasi*-historical time.[9] Socrates' model city will be made vivid, not interrogated either in itself or in its metaphysical foundations.[10]
3. *Timaeus' rhetoric.* What does all of this portend for Timaeus' speech-to-come? Plato has Critias assure Socrates, to his expressed delight (27B), that Timaeus will provide the point of departure for his history of primeval Athens by giving an account "of the origin of the cosmos" and of "the nature of mankind" (27A). The implication is that Timaeus' discourse

will fit with Critias', hence that he too will provide a vivifying exegesis that will operate within the context of prephilosophical assumptions, and in one very important respect, Timaeus does this. Although the content of his discourse, as we shall see, breaks out of this context, the rhetoric with which he presents this content remains bound to it. The key assumption of prephilosophical *doxa* is that the concrete individuals experienced in perception are fundamental realities (cf. *Republic* 476A–B; cf. *Timaeus* 52B). Even while Timaeus acknowledges the possibility that the cosmos may have no temporal beginning (27C), he nonetheless goes on to depict it as created, as if, rather than cofunctional with time, it were a thing *in* time. And each of the key items he requires in order to tell his creation story he portrays as—or as like—an individual in place and time, subject to Becoming. Thus, from the beginning he interprets the "cause" (αἰτίου; 28A4–5) of the coming-to-be of the world as a "craftsman" (ὁ δημιουργός; 28A6) and as a "maker and father" (ποιητὴν καὶ πατέρα; 28C3) who has character and dispositions, thoughts and second thoughts, who mixes and cuts and bends into shape, etc., and who delegates lesser tasks to subordinates; though he is responsible for first fashioning both soul and time, the process character that Timaeus gives the Demiurge's work makes it natural to picture him as a living—hence an ensouled—being who is himself in and subject to time.[11] Second, there are the "models" (παραδείγματα; e.g., 28Aff.; 31A; 37C; 39E) that the Demiurge "looked at" (ἔβλεπεν; 29A3; cf. 51C1) in order to fashion their likenesses—the forms, most conspicuously, of Animal itself, of the kinds of animal, and of the elements; precisely as items there for the Demiurge to "look at," these are portrayed as individuals in a visual, hence spatial, object field. Third, the medium for the likenesses the Demiurge fashions—the "receptacle" (ὑποδοχή)[12]—is made intelligible by a host of similes, each of which presents its constitutive function *for* sensible things by representing it itself as, if not a sensible thing, then at least a spatiotemporally determinate being. Hence it is portrayed as like a "wet nurse" (49A5, 51D5), a lump of gold (50A6ff.), a "mother" (50D3, 51A4–5), a liquid base for perfumes (50E5, 7), a surface for engraving (50E10), "a certain place" (52A6, B4), "a certain space" (52B4), and a "winnowing basket" (52E6–7).[13] Without yet venturing an interpretation of these various figures, we can safely say this: in apparent step with Critias, Timaeus repeatedly represents what must precede Becoming as if it were something subject to Becoming. Thus the rhetoric of his account is measured to suit the prephilosophical "trust" of the unturned.

This brings us to the readers of second intention. What will the philosophically educated few make of the language of the *Timaeus*? Won't the very features that make the dialogue intelligible to the unturned many—Socrates' omission of the longer way, Critias' apparently uncritical translation of the

metaphysical into the mythic-historical, and Timaeus' metaphorical representation of what precedes Becoming by that which is subject to it—be conspicuous and objectionable to those who are at work on the turn and pursuing the longer way? It hardly goes far enough to say that Plato knows this; after all, he has been actively cultivating these few in writing the *Parmenides*, the Eleatic dialogues, and the *Philebus*. Must he not, then, have intended these features of the *Timaeus* to serve as a provocation to these readers? But toward the recognition of what? Can we make out how Plato, in giving Timaeus, in particular, his well-measured rhetoric, also leaves audible in it, for those whose philosophical work gives them ears to hear, a content more appropriate to the properly eidetic order of the cosmos? That is, to articulate the interpretive project that this question implies: can we ourselves, if we now try to occupy the position of those pursuing the longer way and attempt to hear the dialogue from this position, penetrate Timaeus' rhetoric and recognize in his account elements ready to be reconstructed in a more deeply philosophical understanding?

II. Stages of the Longer Way: The God-Given Method of Dialectic

To develop such a reading, we must first digress, looking away from the *Timaeus* and to those dialogues in which Plato provides resources and provocation for the turn. What conception of eidetic order do these dialogues develop and, albeit with their own sorts of Platonic indirection, present? Once we have a view of this, we can turn back to the *Timaeus* to ask how fully, if at all, we find this conception at work within it.

Here, in extremely schematic outline, is a map of the course of thought in those dialogues that, as I see it, most directly pursue the turn:

1. In the *Republic* Plato has Socrates point to the longer way (435C–D; 504B),[14] characterizing the process of philosophical education as the turning of the soul from Becoming to Being (518C–D; 521C) and outlining the preparatory phase, the study of the five mathematical disciplines (521D–531D).
2. In the *Parmenides* Plato has Parmenides initiate the turn by . . .
   a. challenging Socrates' unwitting conception of the forms on the model of sensible things (130B–135C), especially in his reliance on the model/likeness simile (132D–133A)
   b. providing the resources for a conceptual distinction-in-kind of form from sensible thing as, respectively, a "one" that, by virtue of its being not many and not a whole of parts, is not subject to the characters proper to what is in place and time (hypothesis I) and a "one" that, by virtue of its being a whole of parts and a one among unlimitedly many similar ones, is subject to all those characters (hypothesis II)

c. providing a new conception of the form as the source of "limit" (πέρας) to its participants, "whose own nature gives them, by themselves, unlimitedness (ἀπειρίαν)" (158D6) (hypotheses III–IV)
d. introducing the notion of the participation of forms in other forms (hypotheses V–VI) . . .
   i. on the one hand, in "greatness," "equality," and "smallness," as the condition enabling the constitution of sensibles (161C–E)
   ii. on the other hand, in "being" and "not being" with respect to one another, as the condition that lets forms be known discursively (161E–163C).

3. In the *Sophist* and the *Statesman* (up to 287C)[15] Plato has the Eleatic Visitor introduce . . .
   a. on the one hand, the notions of "communion" and "blending" to articulate the notion of the participation of forms in forms introduced in the *Parmenides* (developing 2d above)
   b. on the other hand, the procedure of collection and bifurcatory division as the method of discursive knowledge of the forms (developing 2d.ii above).
4. In the *Philebus* Plato has Socrates introduce . . .
   a. the god-given method of dialectic (16C–18D), the process of collection and *non*-bifurcatory division (developing 3b above)
   b. the account of the imposition of limit (πέρας) upon the unlimited that is constitutive of that which comes-into-being (23C–27C) (developing 2c and 2d.i)
   c. And at the conclusion of the *Statesman* (287C–290E; 303D–305E), with the Visitor's enumeration of the fifteen kinds of art required by the good city,[16] and in the second half of the *Philebus*, with Socrates' sets of distinctions of kinds of pleasure (31B–55C) and of knowledge (55C–59D),[17] Plato provides indirect exhibitions of the god-given method of dialectic at work. These exhibitions provide alternatives, as the more "precise grasps" that Socrates in the *Republic* suggested could be achieved along the longer way (435D1–2), to the tripartitions of city and of embodied soul, respectively, that were provided by the shorter way in books 2–4.

Note: the account of participation provided by hypotheses III–IV of the *Parmenides* (2c above) and the account of dialectic in the *Philebus* presuppose the collaborative interplay of Unity with the dyad of the Great and the Small that Aristotle reports as a Platonic teaching in *Metaphysics* A6. This interplay is only indirectly presented, first in hypotheses II, III, and V of the *Parmenides*[18] and then, with the Great and the Small now subsumed within the broader kind, the Unlimited,[19] in the *Philebus*. Thus the longer way is informed by some of "the so-called unwritten teachings"[20]—which, however, should be understood not as "unwritten" *simpliciter* but rather as "only *indirectly* written."[21]

To give an adequate account of the process of thought that leads through these stages is, of course, too big a task for the present occasion.[22] For the purpose of beginning to read the *Timaeus* in the context of the longer way, however, it will suffice to articulate the unity of 4a and 4b.[23] Collection and *non*-bifurcatory division disclose precisely that set of relations among forms that implies the imposition of limit upon the unlimited and, so, the constitution of that which comes-into-being. We can bring this whole structure to focus—and thus put ourselves into position to listen for its indirect presence in the *Timaeus*—in four steps, seeing how the obscurities in Socrates' distinct accounts (1) of the order of forms revealed by the god-given method of dialectic (*Philebus* 16C–18D) and (2) of the structure of what comes-into-being (23C–27C) are resolved by the ways in which (3) the example he uses for both, the account of musical pitch (17B–E; 26A), and then (4) its analogue, the account of letter-sounds (17A–B; 18A–D), show them to fit together.

A. The Order of Forms (*Philebus* 16C–18D)

Socrates speaks with gnomic compression in his first explication at *Philebus* 16C–E of the god-given method of dialectic. Because "the things that are always said to be consist of [a] one and [a] many and have limit and unlimitedness conjoined within them," the dialectician must begin by "positing a single form (μίαν ἰδέαν)," must next "seek two, if there are [two], or if there are not, three or some other number [of forms],"[24] and must proceed by treating "each of these ones again in the same way." How far does the dialectician push his distinction-making? "Up to the point at which," says Socrates, "one sees, with regard to the initial one (τὸ κατ᾽ ἀρχὰς ἕν), not only that it is one and many and unlimitedly many (ἓν καὶ πολλὰ καὶ ἄπειρα) but also just how many it is." Socrates stresses this last point: one may not "apply the form of the unlimited to the plurality until one sees the total number [of forms] (τὸν ἀριθμὸν . . . πάντα) . . . between the one and the unlimited"; this, he says, "makes all the difference," distinguishing dialectical from merely eristic inquiry.

Of the many questions that present themselves,[25] these are central: what does Socrates intend to designate by "the things that are always said to be" (16C9) and what does he intend, and in what relations to each other, by his pairs "[a] one and [a] many" and "limit and unlimitedness" (16C9–10)? What distinction—and, then, relation—does he intend when he speaks first of the "single form" (16D1) from which division begins and then of "the initial one" (16D5)? How can the unity thus indicated be not only one but also many, and not only many but also both unlimitedly many and some definite number? And what is "the form of the unlimited" (16D7), and how is it that "the plurality"—that is, the unlimitedly many—is organized such that this "form" may be "appl[ied]" to it (16D7–8)?

B. The Structure of What Comes-into-Being (*Philebus* 23C–27C)

Though they share the notions of limit and the unlimited, Socrates' distinctions at *Philebus* 23C–27C appear at first to belong to a distinct domain from his account of the god-given method of dialectic, for they concern not forms but "all the things that *now* exist *in the universe*" (πάντα τὰ νῦν ὄντα ἐν τῷ παντί; 23C4), that is, all that is subject to time and place. Socrates distinguishes this "all" into four kinds: the unlimited (τὸ . . . ἄπειρον; 23C9 and passim); limit (τὸ . . . πέρας; 23C10) or, as he twice puts this more fully, "that which provides limit" (τὸ . . . πέρας ἔχον; 24A2; 26B2);[26] that which has its "coming into being" (γένεσιν εἰς οὐσίαν; 26D8) as a result of the mixing of these first two kinds; and the "cause" of this mixing.[27] Consider each of these, as Socrates introduces them, in turn.

The unlimited, first of all, he explicates as in each case a fluxing relation between relative opposites in which each of the two, simply in being itself, tends to exceed the other. Thus, to take his main example, "hotter and colder": "the hotter," as such, is the *hotter than* what is colder, and vice versa; the relation between them, accordingly, is a symmetrically structured conflict in which each, "always advancing and never staying put" (προχωρεῖ . . . καὶ οὐ μένει . . . ἀεὶ; 24D4), "is at variance with" (διαφόρως ἔχοντα; 25E1) the other. The same holds for each of Socrates' other examples, drier/wetter (25C), more/fewer (πλέον καὶ ἔλαττον; 25C9), faster/slower (25C), greater/smaller (μεῖζον καὶ σμικρότερον; 25C9–10), and, in the context of music, high/low and quick/slow (26A). Every case of the unlimited is thus a dyad in which the terms relate as "more and less" (μᾶλλόν τε καὶ ἧττον; 24A9 and passim), each than the other,[28] or, again, as "intensely and slightly" (σφόδρα καὶ ἠρέμα; 24E8), each relative to the other. The class of "that which provides limit," second, is twice introduced by reference to its members "the equal and equality, and after the equal the double" (25A7–8, also D11); more generally, it is ratio, that is, "all that is related as number to number or measure to measure" (25A8–B1). Imposed upon the unlimited, ratio puts an end to the flux of opposites, establishing "both the quantity [of each relative to the other] and due measure" ([τὸ ποσόν] τε καὶ τὸ μέτριον; 24C7). This imposition is the mixing that constitutes things of the third kind, the whole range of things in place and time that come into being according to a normative order. These include, on the one hand, the physical balances of, for example, hot and cold and, again, wet and dry that make both for the health and strength of individuals and for the rhythm of the seasons in the cosmos and, on the other hand, "the whole variety of beautiful conditions in souls" (ἐν ψυχαῖς . . . πάμπολλα ἕτερα καὶ πάγκαλα; 26B6–7). The "cause," finally, Socrates describes with impersonal expressions as "that which makes" (τὸ . . . ποιοῦν; 26E7; 27A5) and "that which crafts" or "fashions" (τὸ . . . δημιουργοῦν; 27B1), and later he locates within this kind the "wisdom and reason" (σοφία . . . καὶ νοῦς; 30C9) which, in the cosmos as a whole, governs the heavens and is responsible for the ordered motions of the sun, moon, and stars (28E; 30C) and, in human beings, "provides soul to" (ψυχήν . . . παρέχον; 30B1–2) and governs the states of each body (30B).

Of the many questions that an open-ended exploration of this passage would take up, two are crucial for us. Both concern Socrates' class of "that which provides limit." First, if this is the class of ratios, why does Socrates give special prominence to "the equal and equality" and, "after the equal," to "the double"? Second, what is the source of the specific set of ratios that are imposed on any specific unlimited? Granted, "wisdom and reason" belong to the class of the "cause"; insofar as they are by their very nature modes of discerning the good, it follows that they will select ratios that establish "due" balances of the relevant opposites. But what is it, in each case, that determines what this normative order is and, so, gives specificity to the good that "wisdom and reason" recognize?

C. Musical Pitch (*Philebus* 17B–D; 26A)

The fit of Socrates' accounts of the god-given method and of the four kinds begins to come to light if we now consider how his example of musical harmony, the only one he introduces in both passages (17B–D and 26A), brings each account into focus.

To begin with, the example of musical harmony lets us start to sort out the complex one/many relations that Socrates left so obscure in his first characterization of dialectic at 16C–E. As the trifurcation between "low and high . . . and, as a third, even-toned (ὁμότονον; 17C4)" makes evident, the "single form" (μία ἰδέα) from which dialectic begins is Pitch. The trifurcation also makes clear the distinction and relation between this form and "the initial one" (τὸ κατ' ἀρχὰς ἕν). That the middle between low and high is that region of tones in which, relatively speaking, low and high are "even" or "equal" (ὁμό-) implies that low and high are to be understood, each in turn, as the regions in which the one exceeds the other; "high" picks out those tones in which high predominates over low, and "low," those in which low predominates over high. Thus the trifurcation of forms lays open to view, as "the initial one," the field of all possible instantiations of Pitch. And this "one" is at once, as well, an "unlimitedly many" (ἄπειρα), for it is the in principle infinitely divisible continuum of all possible balances of low and high. We can represent it diagrammatically thus:

the single form Pitch ranges over, as "the initial one," the field of

/ | \

high & even-toned & low

which field consists of the unlimited many members of the tone continuum:

high > low ————————high = low ————————high < low

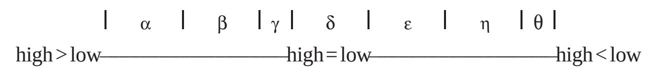
With this understanding, in turn, we have already begun to clarify the sense in which the imposition of limit upon the unlimited is responsible for the constitution of "music in all its perfection" (26A). The tone continuum *is* the unlimited; it is the field over which musical tones, understood as in each case a mutual "variance" of high and low (recall διαφόρως ἔχοντα; 25E1), can fluctuate. The imposition of limit, in turn, is what first bounds this field and selects from it those sounds that are "musical" in a normative sense. At 17C–D Socrates says that one becomes "wise" (σοφός; 17C7) and genuinely "knowing" (εἰδώς; 17C7) of music only by "grasping" (cf. λάβῃς; 17C11) "the number and kinds of intervals (διαστήματα; 17C11) of high and low in pitch and the notes that bound these intervals and all the combinations (συστήματα; 17D2) formed out of these notes—the combinations that our forebears recognized and passed on to us, teaching us to call them 'modes' [lit., 'harmonies' (ἁρμονίας)]." Notes are "on pitch" or "in tune" only insofar as each strikes a balance of high and low that fits together harmoniously with the balances struck by other notes. To fit harmoniously—and, so, to comprise a ἁρμονία or "mode"—tones must stand at the right "intervals" from one another, and these intervals are determined by ratios. The "forebears" Socrates refers to are almost certainly the Pythagoreans, for it was they who discovered the ratios that pick out harmonious notes from the tone continuum,[29] 1 : 2 for the notes that bound the octave, 2 : 3 for the fifth, 3 : 4 for the fourth, 8 : 9 for the whole tone difference between the fifth and the fourth, and so on. By Plato's time music theorists[30] had begun to develop systems in which, by treating the modes as species of the octave and cyclically transferring the intervals, they could relate all the modes as variants of one another, and it is presumably to such understanding that he has Socrates refer at 17C–D.

To get a purchase on this sufficient for our purposes, start with the so-called Dorian mode in the diatonic genus,[31] supplementing the familiar Pythagorean ratios just noted with those which Plato has Timaeus propose for the notes internal to the fourths or tetrachords, namely 8 : 9, 8 : 9, 243 : 256 (*Timaeus* 36A–B). The imposition of these limits, or ratios, on the unlimited, or tone continuum, might be diagrammed as follows:

1						:						2
2				:			3					
3			:		4		[3		:			4]
					8	:	9					
8	:	9					[8	:	9]			
		8	:	9					[8	:	9]	
				243:256								[243:256]

These ratios pick out, as the bounding notes of the intervals they define, these places, that is, these balances of high and low on the tone continuum:

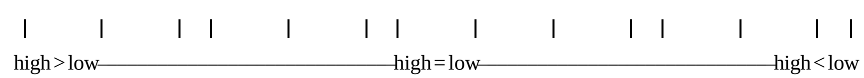
With this as our starting-point, we can now follow the procedure of cyclically transferring intervals to derive the three higher and the three lower modes, yielding seven in all. To make the procedure visible, let me first label each of the intervals in the Dorian diatonic as follows:



Here, by cyclical transfer, are all the modes derivable as variants of the Dorian:

Mixolydian		δ	ε	η	θ	α	β	γ	
Lydian		γ	δ	ε	η	θ	α	β	
Phrygian		β	γ	δ	ε	η	θ	α	
Dorian		α	β	γ	δ	ε	η	θ	
Hypolydian		θ	α	β	γ	δ	ε	η	
Hypodorian		η	θ	α	β	γ	δ	ε	
Hypophrygian		ε	η	θ	α	β	γ	δ	

These seven modes collectively span, or imply as the matrix from which each draws its notes, a nearly two-octave stretch. All that is required to extend this stretch to a full double octave is to add one further note—which harmonic theorists, at least as early as Aristoxenus, therefore called "the added [note]," ὁ προσλαμβανόμενος [φθόγγος]—at an interval of one tone (or 8 : 9) lower than the last note of the lowest mode. The full matrix of notes that results, called the Greater Perfect System, is a set of fifteen; it has a "middle" note (μέση) exactly an octave from the first and from the fifteenth, and it is internally organized into two pairs of conjunct tetrachords plus the "added note." Continuing, as above, to lay out the notes so as to suggest the ratios that, by defining the intervals between them, fix their locations on the tone continuum, we can diagram the complete matrix of notes as follows:



If it is right that Plato had in mind an account of this type at *Philebus* 17C–D, we must next ask where these ratios come from. This is the issue we raised with our two questions at the close of §II. B: why does Socrates give special prominence to "the equal" and "the double," and what is the source of the specific set of ratios that are imposed on any specific unlimited? The key, I

suggest, is that one becomes σοφός (wise) and εἰδώς (knowing) by the practice of the god-given method of dialectic, and dialectic is the collecting and distinguishing τῶν εἴδων (of forms).[32] It is the understanding of the single form Pitch that leads one to distinguish "high and low . . . and even-toned," and this distinction not only discloses the continuum but delimits it by means of "the equal" and "the double." Insofar as the extremes "high" and "low" are mutually opposed predominances with a middle region of even or equal balance, the intervals from the middle to each extreme will be equal, and the whole length of the continuum will relate to each of these intervals in the ratio of 2 : 1 or double. Further, Socrates says the practitioner of dialectic must proceed beyond the initial division by treating "each of these ones in the same way"—hence, by continuing to distinguish forms. Putting this together with the foregoing account of limit as ratio, we can say that "*that which provides ratio*" is form.[33] Between the unity of the single form Pitch and the unlimited plurality of possible balances of high and low opened up by his initial trifurcation, the dialectician seeks the limited plurality of forms of pitches that, because the sets of balances they pick out go together harmoniously, define the various modes and, so, set the conditions for the good instantiation of the single form.

Thus understood, Socrates' accounts of the god-given method (16C–18D) and of the four kinds (23C–27C) fit together to give us a remarkable vision of the eidetic order disclosed by dialectical insight. By "things that are ever said to be," Socrates refers not only to forms but also to the larger complex that forms, in their causal power, imply, an order of forms, of the mathematicals that they call for, and of the normative order for sensibles that these mathematicals express. To bring this into focus in one synoptic set of formulations: a single form (here, Pitch) implies, first, a "two . . . or three . . . or some other number [of forms]" (here, high and even-toned and low) that frame a continuum, and, second, "between" itself and the unlimitedly many places on the continuum, a limited plurality of forms (here, the forms of the pitches that go together as modes); these forms, in turn, imply ratios that pick out places on the continuum (here, balances of high and low); and these balances, in their turn, are the normative specifications (here, the variety of apportionments of high to low that a mode requires of its member notes) that actual sensibles must meet if, in their coming-into-being, each is to be a good instantiation of its corresponding form and, so, all together are to be a good instantiation of the single form.

D. Letter-Sounds (*Philebus* 17A–B; 18A–D)

At *Philebus* 18A Protarchus and Philebus both express their satisfaction with Socrates' explication of the application of dialectic to music, and they want Socrates to go on to explain its application to the question of the good. But Plato has Socrates delay, insisting that they first consider a second example, the account of letter-sounds (18A–D). We should first retrace Socrates' presentation of this account, then consider its significance.

In Socrates' exposition so far, the assumption has been that the dialectician starts from a single form and proceeds to identify the limited plurality of forms between it and the unlimited; but there is nothing necessary about this sequence. Sometimes, he says, the dialectician "is forced to start out with the unlimited" (18A) and make his way from there to the limited plurality and only then to the single form. Thus, in the tale of the first identification of the letter-sounds, Theuth begins with the recognition that spoken sound is "unlimited" (ἄπειρον; 18B6), and by a two-step trifurcation he sorts it into three regions, bringing to view a continuum analogous to that of high and low in music. He first gathers those that are "voiced" (τὰ φωνήεντα; 18B8) into a group by distinguishing them from "others that, while not voiced, do have a certain sound" (ἕτερα φωνῆς μὲν οὔ, φθόγγου δὲ μετέχοντά τινος; 18C1), and he then distinguishes these latter from those that are "unsounded as well as unvoiced" (τά τε ἄφθογγα καὶ ἄφωνα; 18C4), that is, "those we now call 'mutes' (ἄφωνα)" (18C3); the class of those "that, while not voiced, do have a certain sound" he characterizes as "the middle [ones]" (τὰ μέσα; 18C5). Thus he traces a continuum from sounds uttered with the maximal release of breath to those uttered by the maximal cutting-off of breath. He then sorts through each region and identifies within each a limited number of "ones" (18C4), namely, the various individual mutes, sounded consonants, and vowels. Only at the end of this sorting does Theuth recognize the single form that has this limited number of "ones" as its instantiations: because his search has led him back and forth between some types of letter-sounds that cannot be heard in isolation from others and other types that enable (and are bounded by) the articulation of these, he recognizes combinability-with-others as a normative feature of each and collects them all under the single form στοιχεῖον—that is, at once, "letter-sound" or "element" (18C6).[34]

Why does Plato have Socrates make a point of introducing his second example? The effect is to show that the same eidetic order is disclosed even when dialectic proceeds by a very different path and with very different resources. In the letter-sounds example, we lack the single form at the outset, and division moves toward collection rather than beginning from it; the first cuts, rather than directly disclosing the continuum by naming the opposites and middle that frame it, pick out regions on the continuum; and because we lack anything equivalent to the Pythagorean ratios, we must instead establish the relative positions of the letter-sounds on the continuum—to be conceived, presumably, as ranges rather than points—by case-by-case distinctions and comparisons. Nonetheless, dialectic does once again disclose a single form that requires, for its instantiation, the instantiation of a limited plurality of forms, and these do pick out different places on a continuum framed by opposites and ranging from the preponderance of one to the preponderance of the other. Even if we lack a particular set of numbers by which to mark these different places, we have the structure itself that such numbers would express: by the differences in the places they pick out, the forms select a set of different

balances of the opposites; and this set of balances provides normative specifications for the actual sensibles that, in their interplay, instantiate the single form. Thus we see again, as we saw in the music example, how the single form, through the mediation of the limited plurality of forms that dialectic discloses, "provides limit," imposing it on the unlimited. We might diagram this eidetic order in its two analogous appearances as follows:

the single form:

στοιχεῖον (letter-sound, element) — / | \ — "the voiced" | "others not voiced but having a certain sound" | "the both not voiced and not sounded"

Pitch — / | \ — high | even-toned | low

the limited number of "ones":

[forms of the various letter-sounds][35] [forms of the pitches that make up modes]

the continuum (i.e., the unlimited) and the places which these "ones" pick out on it:

(—)(—)(—)(—)(—)(—)(—)(—)(—)(—) | | | | | | | | | | | | | | | | |

|————————————————| |————————————————|

(maximal release of breath) (maximal cutting off of breath) high > low high = low high < low

sensibles that, insofar as they conform to the balances picked out on the continuum, are good . . .

. . . particular letter-sounds in speech . . . particular pitches in music

Again, there is much more to be said in interpretation of the notion and stages of the longer way. But for the present, these remarks must suffice. Schematic as they are, they provide a context in which, closely heard, key parts of Timaeus' account of the cosmos present themselves in a new light.

III. Two Cases of the God-Given Method: Timaeus' Accounts of the Elements and the Animals

At 69B–C Timaeus, making his third beginning by summing his first two, distills the Demiurge's fashioning of the world into two fundamental phases: the Demiurge "first gave order" (πρῶτον διεκόσμησεν; 69C1) to an initially "disorderly" (ἀτάκτως ἔχοντα; 69B3) many, introducing the manifold proportionality that lets us now "call them by the names 'fire' and 'water' and the rest"

(69B6–7), and "then out of these he constructed this universe (πᾶν τόδε), one animal containing within itself all animals, both mortal and immortal" (69C1–3). In each phase we can make out, not as the content itself that Timaeus explicitly presents but in the prior thinking that first gives him this content, the vision of eidetic order we have reconstructed from the longer way. Consider first the ordering that gives rise to the elements, then the fashioning of the animals.

A. The Constitution of the Elements

Timaeus' account of the fashioning of the elements unites subsections from the larger accounts of "the works of reason" (τὰ διὰ νοῦ δεδημιουργημένα; 47E4) at 29D–47E and of "the things that come to be through necessity" (τὰ δι' ἀνάγκης γιγνόμενα; 47E4–5) at 47E–69A. Seen whole, it provides the orienting frame of reference both for the geometric speculations by which Timaeus identifies the fundamental shapes of the elements and for the empirical inquiry he initiates into the range of physical stuffs in the world. The key passages for us to consider are (1) 31B–32C, (2) 52D–53C, and (3) 55D–56B, 58C–59C, and 60B–E.

The Establishment of Proportionality (31B–32C). "Now that which comes to be must be of bodily form (σωματοειδές)," says Timaeus at 31B4, "and so [it must be] both visible and tangible (καὶ ὁρατὸν ἁπτόν τε)."[36] Thus visibility and tangibility will both be present in everything bodily—but, as Timaeus goes on to make clear, in different measures, for visibility requires fire, and tangibility requires solidity and, so, earth. We need to be careful here not to lose the sense of the Greek in its English translation. Clearly, ὁρατόν cannot mean "visible" in the merely passive sense of "able to be seen," for earth is fully "visible" in this sense. When Timaeus takes fire as paradigmatically visible, he makes evident that by *horaton* he means to convey the more active sense of "causing visibility" or "first letting [something] be able to be seen." Fire lets itself and whatever is in its proximity be seen by giving light. Earth would be the least visible in this active sense of *horaton* in that in its solidity it neither gives light nor lets light pass through itself. The same point applies analogously to the sense of *hapton,* "tangible." As earth can be seen, so fire can be touched; but if, following Timaeus, we shift attention from this passive sense of tangibility to the active sense of that character that "first lets a thing be able to be touched," we will think of a thing's solidity; it is in this sense that earth is the most tangible and fire the least.[37]

Timaeus will later give us occasion to say more about how, in their active senses, *horaton* and *hapton* are related. Already, however, we can begin to make out some of the features of the eidetic order disclosed by the god-given dialectic of the longer way. Timaeus gives us (1) a single form, τὸ σωματοειδές or the Bodily; (2) an initial division that suggests, as opposed extremes that frame a continuum, maximal visibility (with minimum tangibility) and maximal

tangibility (with minimum visibility); and (3) the first two members of the limited plurality of forms, members that pick out these opposed extremes. Thus we have, at this point:

the single form:
τὸ σωματοειδές (the Bodily)
/ \
ὁρατόν ἁπτόν
the limited number of "ones":
Fire & Earth
the continuum (i.e., the unlimited) and the places which these "ones" pick out on it:
|——————————————————————————————|
(maximal visibility with minimal tangibility) (maximal tangibility with minimal visibility)

Next Timaeus declares that for two things to be "well (καλῶς) combined," they must be joined by a "bond in the middle" (δεσμὸν . . . ἐν μέσῳ), and "the most beautiful bond" is that "proportionality" (ἀναλογία)—namely, geometric proportion—that establishes a "mean" (τὸ μέσον) between the two such that what "the first is in relation to [the mean], [the mean] is in relation to the last" (31B–32A). Thus joined, the two are "made one as much as possible" (31C). But, he goes on, the body of the world is to be a solid, and "not one . . . but two means (μεσότητες)" are needed to "harmonize" (συναρμόττουσιν, 32B3) solids; hence there must be two means between fire and earth. Timaeus says no more than this; he does not pause to argue the mathematical claim he makes, and he does not give any particular numbers to specify the geometric proportion. The mathematical argument for two means has been most plausibly retrieved from Euclid by Heath:[38] geometric proportion between any two cube numbers requires two means; if we make the assumption that solids, as three dimensional, are properly expressed by cube numbers, then between any two solids given by the (anachronistically symbolized) numbers p^3 and q^3, geometric proportion requires the means p^2q and pq^2.

If we now supplement the relevant part of our diagram by inserting these numbers as follows,

Fire & Earth
$\mathbf{p^3}$: $\mathbf{p^2q}$: $\mathbf{pq^2}$: $\mathbf{q^3}$
|——————————|——————————|——————————|
(maximal visibility with minimal tangibility) (maximal tangibility with minimal visibility)

we make visible two general implications of the geometric proportion. First, there is a gradient of shifting preponderances between the extremes paradigmatically represented by fire and earth. Second, the Bodily implies, between fire and earth, two further forms on par with them, the first of which is (to use the language of geometric proportion) as many times more tangible than fire as the second is more tangible than it and, again, as earth is more tangible than the second; conversely, beginning with earth, the second will be as many times more visible than earth as the first is than it and, again, as fire is than the first. Note that these numbers play a role analogous to that of the Pythagorean ratios in music theory: they articulate the relations of intervals, that is, the equalities (and inequalities) of the distances between places on the continuum. Thus they prepare us well for Timaeus' identification of the two middle forms as Air and Water. The transparency of air and the moderate opacity of water make them well-spaced steps from the maximal visibility of light-giving fire to the minimal visibility of wholly opaque earth; conversely, the fluid density of water and the relative bodilessness of air make them well-spaced steps from the maximal solidity of earth to the minimal solidity of fire. Thus we have, with but one major reservation, the major features of the eidetic order disclosed by the god-given method:

the single form:
τὸ σωματοειδές (the Bodily)
/ \
ὁρατόν ἁπτόν
the limited number of "ones" which it requires:
Fire & Air & Water & Earth
the continuum (i.e., the unlimited) and the places which these "ones" pick out on it:
$\mathbf{p^3}$: $\mathbf{p^2q}$: $\mathbf{pq^2}$: $\mathbf{q^3}$
|——————————|——————————|——————————|
(maximal visibility with minimal tangibility) (maximal tangibility with minimal visibility)

Here we must pause, however, to raise a problem with regard to the way, to this point in Timaeus' account of the elements, Plato has him represent the unlimited. In the *Philebus*, the extremes which framed the continuum were opposites—high and low, hot and cold, fast and slow, and so on. In what Timaeus establishes, the preponderances of visibility over tangibility and vice versa are opposed, but it is not clear that the terms themselves, visibility and tangibility in their active senses, are opposites. To determine how fully Timaeus' account points back to the notion of the unlimited that was disclosed along the longer way, we need to ask: what is it, in or about that which lets something be visible, that is opposed to what, in or about that

which lets something be tangible, and vice versa? And—supposing that we can indeed identify such an opposition—does it imply the continuum between the opposed preponderances of visibility and tangibility that Timaeus has established?

The "Sifting" of the "Powers" (52D–53C). In Timaeus' discourse, the formation of the world involves the subordination of nonteleological "necessity" (ἀνάγκη) to teleological "reason" (νοῦς). Were necessity alone to preside, that which comes to be would tend to "stray" (cf. πλανωμένης; 48A7) or "drift" (φέρειν; 48A7), lacking not order as such but, specifically, orderedness according to the good.[39] In Timaeus' personifying language, the Demiurge must "persuade necessity" to let "what comes-to-be be directed toward the best" (47E – 48A). As we saw earlier, in Socrates' account of the four kinds in the *Philebus,* he presents the unlimited as in each case a fluxing relation between relative opposites in which each of the two, solely in being itself, tends to exceed the other. The continuum that this relation implies, while not, *qua* continuum, without order, is nonetheless indifferent to the good; in itself it is only the array of possible instantiations of the single form, and only the imposition of limit upon it establishes a normative order for what comes-into-being. It is therefore appropriate that, while Timaeus introduces the Bodily and the forms of the elements in the "works of reason" section of his discourse, 29D – 47E, it is not until the second part, focused on what "comes-to-be through necessity," 47E – 69A, that he provides the resources for a sufficient understanding of the continuum.

The key passage is 52D – 53C, Timaeus' evocative description of the disorderly motions in the receptacle in the time before the Demiurge fashions the world and time itself;[40] the description provides a marvelous image of the unlimited as a continuum. The "four kinds" (τὰ τέτταρα γένη; 53A3), Timaeus says, are present in the receptacle but only as "dissimilar powers, not in balance" with each other (μηθ' ὁμοίων δυνάμεων μήτε ἰσορρόπων; 52E2)—for the Demiurge has not yet imposed geometric proportion or (what will go along with this) assigned them their distinctive figures. What are these powers? They express themselves as motions; indeed, as motions they are at least equi-primordial with, if not prior to, that of the receptacle, for Timaeus says that it is their motions that cause the motion by which, in turn, the receptacle moves them (52E). But they are dissimilar and not in equal balance. Hence we can ask, in what various ways do they move, and what are they, such that they move in these ways? They reveal themselves in their differences by distributing themselves in the receptacle. Timaeus pictures them as varieties of grain being sifted in a winnowing basket: as they move and are moved, they "drift continually, some in one direction and others in others, separating from one another" (ἄλλα ἄλλοσε ἀεὶ φέρεσθαι διακρινόμενα; 52E5 – 6), with "the most unlike [being] bounded off the furthest from one another and the most like [being] gathered most of all into the same region" (τὰ μὲν ἀνομοιότατα πλεῖστον αὐτὰ ἀφ' αὑτῶν ὁρίζειν, τὰ δὲ ὁμοιότατα μάλιστα εἰς ταὐτὸν συνωθεῖν; 53A4 – 6). At the furthest remove from one another, accordingly, are, at one extreme, "the dense and heavy" (τὰ μὲν πυκνὰ καὶ βαρέα) and, at the other, "the rare and light" (τὰ δὲ μανὰ καὶ κοῦφα; 53A1 – 2); between these, in turn, will be those neither so dense and heavy as the densest and heaviest nor so rare and light as the rarest and lightest. And because the same principle of sifting operates in each part of the receptacle – winnowing basket as in the whole, the distribution will tend to be gradual and continuous. This is why, Timaeus explains, "even before the universe was set in order and, so, brought into being,"[41] the four kinds, albeit only as motions, "came to occupy different places" (53A6 – 7).

Here we have the continuum framed by opposites and a middle that is presupposed by Timaeus' contraposition of maximal visibility and maximal tangibility at 31Bff. Dense and rare, and again heavy and light, are pure mutual relatives, each being essentially an exceeding of the other; to be, for example, dense *is* to be denser than what is, correlatively, rarer, and vice versa. To move from the denser to the rarer, moreover, requires passing through a middle in which, the relative diminishing of the one being matched by the relative increase of the other, the two become equal or even. And the continuum of shifting preponderances thus constituted is in principle infinitely divisible; hence it is an unlimited many. In all these respects, what Timaeus provides here meets the criteria for being an unlimited in Socrates' sense at 23C – 27C of the *Philebus.* In their two conjunctions, moreover, dense with heavy and rare with light, these powers both set into opposition and explain *horaton* and *hapton* in their active senses, "that which lets something be visible" and "that which lets something be tangible." To be πυκνόν (dense) is to be compact and concentrated, to tend inward toward a center, and to be βαρύ (heavy) is to tend downward; taken together, these terms describe the *compressedness* and *tendency to settle* that, as motion-properties, make for the solidity and, so, tangibility of earth. By contrast, to be μανόν (rare) is to be "loose or open in texture" (LSJ 1079 §I), hence spread out and scattered, and to be κοῦφον (light) is to tend upward; taken together, they describe the *self-dispersing* and the *rising* that, as the motion-properties of fire, the Presocratics associated with the dissemination of light and, so, visibility.[42]

We can therefore modify our reconstruction of the vision of eidetic order that guides Timaeus' account of the constitution of the elements as follows:

the single form:

τὸ σωματοειδές (the Bodily)

/ \

ὁρατόν ἁπτόν

the limited number of "ones" which it requires:

Fire & Air & Water & Earth

the continuum (i.e., the unlimited) and the places which these "ones" pick out on it:

$\mathbf{p}^3$:	$\mathbf{p}^2\mathbf{q}$:	$\mathbf{pq}^2$:	$\mathbf{q}^3$
rare (> dense) & light (> heavy)	rare = dense & light = heavy	rare (< dense) & light (< heavy)	

Orienting Inquiry: Geometric Construction and Empirical Research (55D–56B; 58C–59C; 60B–E). Once we recognize the implicit presence of this eidetic order in Timaeus' accounts of the constitution of the elements and of the precosmic motions in the receptacle, we can also recognize important ways in which it appears to be at work orienting the treatments of the elements he goes on to offer. Given limitations of space, let me simply mark the way it appears to underlie and orient, first, his speculative assignments of distinct geometric figures to the four elements at 55D–56B and, second, his wide-ranging empirical survey of the "infinite variety" (τὴν ποικιλίαν . . . ἄπειρα; 57D4–5) of their subkinds at 58C–59C and 60B–E.

The Assignments of the Four Regular Solids to the Elements (55D–56B).[43] At 53B2 Timaeus speaks of the motions of the rare and light and the dense and heavy in the precosmic receptacle as the ἴχνη, the "traces" or "tracks" of the four elements. This is at first puzzling to hear, for "traces" in this sense are the distinctive impressions left behind by the corresponding bodily shapes of things,[44] and the Demiurge has not yet assigned to the four their proper "figures and numbers" (εἴδεσί τε καὶ ἀριθμοῖς; 53B5). But this paradox provides the clue to the way to read the following passage, in which the Demiurge makes these assignments. Putting himself in the position of the Demiurge,[45] Timaeus begins with the characteristic motion-properties of the elements and, understanding that a body will move as it does as a result of the shape that it has, asks what single shape the atomic bodies making up each element must have in order that the element have its characteristic motion. Thus the identification of the continuum of the opposites provides the basic framework within which he matches elements and geometric figures. At one extreme, it is the preponderant heaviness and density of earth that make it appropriate for the bodies comprising it to be cubes, for of all the regular solids the cube is the "most immobile" (ἀκινητοτάτη; 55E1)—that is, most settled—and "most pliable" (πλαστικωτάτη; 55E2)—that is, most resistant to breaking up[46] because most compressed. Likewise, when Timaeus selects the figures appropriate for fire, air, and water by establishing as criteria that they must range from "most mobile" for the shape of fire to "least mobile" for the shape of water, with the shape of air as "the mean" (τὸ . . . μέσον; 56A3), he again appears to take his fundamental bearings from the continuum; for as we saw, it is the maximal preponderances of rare over dense and of light over heavy that

are expressed in the extreme mobility of fire, and it is the relative declines in these preponderances that are expressed in the declining mobility and increasing stability-of-form of air and water. Thus the forms' selection of places on the continuum underlies the assignment of the tetrahedron to fire, the octahedron to air, and the icosahedron to water.

The Surveys of Subkinds of the Four Elements (58C–59C and 60B–E). At 57C–D Plato has Timaeus observe that the plurality of possible sizes of the basic triangles gives rise to an "infinite variety" (τὴν ποικιλίαν . . . ἄπειρα; 57D4–5) within each of the four kinds. This remark is important to us for two reasons. First, it implies that each of the forms of the four has an infinite plurality of subkinds, and this suggests that we should think of it as picking out not a point but a region on the continuum. Second, in making this remark, Timaeus prepares the way for the several surveys of these subkinds that he gives at 58C–59C and 60B–E. Plato has him present these surveys as a host of empirical distinctions; he neither unites them systematically nor thematizes his method of proceeding. If, however, we have discerned the eidetic order implied by 31B–32C and 52D–53C, we can recognize it at work as the frame of reference that gives Plato his bearings.

Heard with that order in mind, four features of Timaeus' analyses become conspicuous. (1) Plato has Timaeus proceed step-wise from fire through air and water to earth, repeating the order in which, in his earlier assertion of geometric proportion, he set them over the continuum as the forms required by the Bodily. (2) Timaeus begins his surveys of fire and of earth by identifying the subkinds—flame (58C6) and stone (60B7)—that exhibit the maximal possible preponderances of the rare and light (over the dense and heavy) and of the dense and heavy (over the rare and light), respectively. (3) For *each* of the four elements Timaeus distinguishes subkinds that relate as states on a continuum between relative opposites. Fire he sorts into the series flame, the light-giving effluence of flame, and the glow of dying embers (58C–D). Air he divides into "the brightest" (τὸ . . . εὐαγέστατον; 58D2), namely, the "aither" or radiant upper atmosphere; "the murkiest" (ὸ . . . θολερώτατος; 58D2–3), namely, the "mist and dark" (ὁμίχλη τε καὶ σκότος; 58D3) associated with fog and cloud (58D3); and the "nameless others" that must, given that these first two are extremes, fall between them. Water he distinguishes into the states of "liquid" (ὑγρόν; 58D5) and "liquefiable" (χυτόν), with the conversion between them being a matter of the approach and withdrawal of fire (58E; 59D).[47] And earth he sorts into a series ranging from the maximally "compressed" (συνωσθεῖσα; 60C5), namely, stone, at one extreme, to the only "half-solid" (ἡμιπαγῆ; 60D6), namely, soda and salt, at the other, with ceramic and lava in the middle. (4) The bordering extremes of each of these continua appear, in turn, continuous with one another. Thus ember-glow and ether are closely akin; misty air grades into rain; and gold appears to converge, as the "densest" (πυκνότατον; 59B2)[48] state of water, with soda and salt, as the most porous states of earth.

If we now step back and take (2)–(4) together, what emerges to view is one comprehensive continuum of shifting preponderances, framed by the extreme preponderance of the rare and light (over the dense and heavy) that is exhibited by flame, on the one hand, and the extreme preponderance of the dense and heavy (over the rare and light) that is exhibited by stone, on the other hand. And this, now to include (1), is the continuum of possible instantiations of the Bodily on which the forms of the four elements, the limited number of "ones" between the Bodily and its unlimitedly many possible instantiations, each selects a different region. Thus Timaeus' distinctions tacitly reconstitute—and reveal Plato to be operating within the orienting context of—the eidetic order implied by the god-given method of dialectic.[49]

B. The Constitution of the Animals

After first establishing the proportionality that lets the elements be, says Timaeus at 69B–C, the Demiurge goes on to construct "out of them this universe, one animal containing within itself all animals, both mortal and immortal." In Timaeus' account of the relations of the kinds of animals we can again make out—and, again, not as the explicit content Timaeus presents so much as in the thinking that first gives him this content—the eidetic order implied by dialectic. Now, however, dialectic proceeds without anything like the Pythagorean ratios or geometric proportion that guides it in the accounts of musical pitch and the elements, respectively. As we shall see, Timaeus' treatment of the kinds of animals is analogous rather to Socrates' account of the letter-sounds.

The key passage is the final section of the dialogue, 90E–92C, the surprisingly comic story of how "the other animals [than humans, the gods, and the world as a whole] came-to-be" (90E). To be prepared to hear this story well, we must first take note of three earlier passages: (1) 39E–40A, (2) 77A–C, and (3) 87C–88B.

1. The Sorting of the Animals according to the Elements (39E–40A). In fact, Timaeus *appears* to have offered a dialectical sorting of the kinds of animals much earlier, near the end of the "works of reason" section of his discourse. There he tells how the Demiurge, having created the world-animal and time, now furthers the likeness of the world-animal to its model, "the perfect and intelligible Animal" (τῷ τελέῳ καὶ νοητῷ ζῴῳ; 39E1): "He planned (διενοήθη) that it too should possess the same sorts and number of forms (ἰδέας) as those which reason sees (νοῦς . . . καθορᾷ) to be within the Animal that is (τῷ ὃ ἔστιν ζῷον). There are four: first is the celestial race of gods; next is the winged, who make their way through the air; third is the kind that lives in water; and the class that is footed (πεζόν) and lives on land is fourth. The divine he made mostly of fire, to be the brightest and most beautiful to see" (39E7–40A4).[50]

On careful inspection, however, this sorting proves very problematic, leaving crucial questions for us to address. First, Timaeus models the division

of the animals on that of the elements, identifying their kinds by correlating one of the elements with each—fire for the gods, air for birds, water for fish, and, implicitly, earth for the footed who live on land. But such a classification focuses on the material makeup of their bodies or dwelling places, and this leaves their nature *as animals* concealed. Ζῷα are "living beings": they transcend material being by being ensouled, and their various sorts of souls, in turn, require of their material makeup that it take the organic form of this or that body-type. But body-type is only alluded to in Timaeus' references to wings and feet, and there is no reference to sorts of soul. To do justice to the kinds of animals in their animality, must not the account be reoriented so as to take its bearings not from the elements that compose their bodies but from the various soul-body relations that determine the sorts of life they live?

Further, by focusing only on the forms of animals that "reason sees to be *within* the Animal that *is*," Timaeus' division fails to include the most important form of all—that of "the Animal that *is*," itself. Not including this form would be appropriate if it related to the four kinds either as genus to species or as whole to parts. But it does not.[51] A genus is instantiated in, not apart from, the individuals that instantiate its species, and such is not the case with the Animal that *is;* it is instantiated as the world-animal, an individual in its own right apart from the gods and other animals who dwell within it. This is also the reason why, even though Timaeus earlier characterized "the intelligible animals" (τὰ . . . νοητὰ ζῷα; 30C7) as "parts" (μόρια; 30C6) of Animal itself, Animal itself is not the whole of these parts; whatever the sense in which it may be said to "comprehend and hold [them] in itself" (ἐν ἑαυτῷ περιλαβὸν ἔχει; 30C8), Animal itself does not consist of them, for it has its own character and its own instantiation in distinction from theirs.

These reflections leave us with two new questions. First, insofar as Animal itself has its own instantiation, it cannot be the single form in which the kinds of animals are collected and which, in turn, requires them as the limited number of "ones" that together instantiate it. On the contrary, it is itself among this limited number; as neither the whole of the other four nor a form of a higher classificatory order, it belongs together with them as a fifth. What, then, is the single form that gathers and requires these five? Second, we risk overcorrecting if we think of Animal itself as *merely* a one among the others; does it not have a certain preeminence, standing out from the four in ways that they do not stand out from one another? But this is hard to bring to focus, for if we are right to object to sorting the animals in terms of the elements, then we do not yet know how to differentiate the animals who dwell within the world. Hence we need to ask from the beginning: how do all the animals, the world-animal included, differ from and relate to one another?

2. The Introduction of Plants (77A–C). The situation is both complicated and, if only very provisionally, clarified when Timaeus introduces a new kind of animal, that of "trees and plants and seeds" (77A6). Plants cannot be included in Timaeus' fourth kind at 40A, for though they live on land, they are

not "footed"; Timaeus goes out of his way to point out that they "remain fixed and rooted" (77C3 – 4) and so lack the power of locomotion.[52] Moreover, they "share in" only "the third [sc. the appetitive] kind of soul" and so, while they do experience the "pleasant and painful sensations that go with appetites (ἐπιθυμιῶν)," they lack "opinion and reckoning and reason" (δόξης . . . λογισμοῦ τε καὶ νοῦ; 77B3 – 6). Nonetheless, minimal as their claim may be,[53] Plato has Timaeus declare repeatedly that they do count as a kind of animal: "they are a different animal (ἕτερον ζῷον)" (77A5); "everything whatsoever that shares in living (πᾶν . . . ὅτιπερ ἂν μετάσχῃ τοῦ ζῆν) is justly and most correctly called an animal (ζῷον)" (77B1 – 3); this kind of being "lives and is no other than animal" (ζῇ . . . ἔστιν τε οὐχ ἕτερον ζῴου; 77C3).

The introduction of plants complicates the situation by giving us yet another kind of animal to consider. What is more, plants are a kind as different as possible from the kind we just found it necessary to add to Timaeus' list at 39E – 40A: on account of the soul the Demiurge fashions for it, the world-animal possesses in the highest degree the "opinion and reckoning and reason" that plants lack. How, then, is the even more varied host of animals we have now collected to be distinguished and related?

The very provisional clarification pertains to the issue of the single form. Plato has Timaeus stress that an "animal" (ζῷον) has its status as an animal by virtue of its participation in "life" (τὸ ζῆν). Is it right to hear in this an indication of the form that, on the one hand, gathers the various kinds of animal within itself and, on the other, requires their instantiation as its own? If so, however, our knowledge of the eidetic order revealed by dialectic should lead us to expect that this form first implies, to recall the language of *Philebus* 16D3 – 4, "two . . . or . . . three or some other number [of forms]" that frame a continuum from which these various kinds select corresponding places. Does Life, τὸ ζῆν, imply any such structure?

3. "The Most Authoritative and Important of Proportions": Body and Soul, Nourishment and Wisdom (87C – 88B). The reader who, coming from the longer way, brings these questions to the *Timaeus* will find 87C – 88B very striking. In the course of a discussion of disease and health in human beings, Timaeus pauses to situate his thought in a more general context:

> All that is good is beautiful, and the beautiful is not ill proportioned (ἄμετρον). One must affirm, accordingly, that an animal (ζῷον) in such condition will be well proportioned (σύμμετρον). Of proportions (συμμετριῶν), the less important ones we perceive and calculate, but the most authoritative and important escape our reckoning (ἀλογίστως ἔχομεν).[54] For health and disease and virtue and vice, no proportion and disproportion (συμμετρία καὶ ἀμετρία) is more important than that of soul itself in relation to body itself (ψυχῆς αὐτῆς πρὸς σῶμα αὐτό)—yet we do not examine this at all or bear in mind that whenever a soul that is strong and great in every respect (ἰσχυρὰν καὶ πάντῃ μεγάλην) is borne by a weaker and smaller frame (ἀσθενέστερον καὶ ἔλαττον εἶδος), and again whenever these are combined in the contrary way, the animal as a whole is not beautiful because it is lacking in the most important of proportions. (87C4 – D7)

For an animal to be good and beautiful requires that its soul and body be well proportioned to each other. As we have just noted, an animal, ζῷον, is an instantiation of Life, τὸ ζῆν. Hence, to restate Timaeus' point in the language of the longer way, the form Life requires, as the frame of reference for its instantiation, that the opposites "soul itself" and "body itself" stand in mutual relation. And, as in our earlier examples of musical pitch and letter-sounds and, now, the elements, so here, this relation has the structure of a continuum of proportions. When Timaeus characterizes a body with the comparatives "weaker" and "smaller," he refers back to his characterizations of the soul that goes with this body as "powerful" and "great," revealing these latter to be relative terms as well. "Soul itself" and "body itself," his language implies, frame a continuum of possibilities ranging from the one being "more powerful" and "greater" than the relatively "weaker" and "smaller" other to the other being "more powerful" and "greater" than the relatively "weaker" and "smaller" one, with, necessarily, a middle region in which they are relatively equal or evenly balanced. This middle region is crucial to Timaeus' point, which is concerned with the good and beautiful. Life, to be *well* instantiated, requires of the animal in which it is instantiated that its soul and body not exceed one another in either direction but be evenly balanced.

Even as this account first presents itself, however, it requires a fundamental clarification. Proportion requires the comparability of its terms, and this seems to be lacking between body and soul. Timaeus' analogy at 87E, ostensibly offered to explicate the comparison, serves rather to bring its difficulty into focus. It is one thing to say that a man's "legs are too long" (ὑπερσκελές; 87E1); the notion of length applies univocally to legs and to torso, and this lets them be straightforwardly compared. But what is the univocal notion of power or greatness that allows us to characterize a soul as κρείττων (87E6) relative to a body? What does it mean to relate a body to a "mind" (διανοίᾳ) as "great" (μέγα) to "small" (σμικρᾷ) and as "exceedingly strong" (ὑπέρψυχον) to "weak" (ἀσθενεῖ) (88A7 – 8)? As is displayed in Timaeus' droll examples of the intellectually powerful but physically enervated thinker and the dull-witted hulk, greatness and smallness and, again, strength and weakness have different first-order senses in their applications to soul and to body. How, then, may body and soul be understood as relative opposites that stand in a range of proportions?

Plato points the way in a crucial aside he has Timaeus make at 88A8 – B3. "Natural to humans," he notes, "are two desires, that through the body for nourishment (διὰ σῶμα μὲν τροφῆς) and that through the most divine of what

is within us for wisdom (διὰ δὲ τὸ θειότατον τῶν ἐν ἡμῖν φρονήσεως); the motions of the stronger will predominate (αἱ τοῦ κρείττονος κινήσεις κρατοῦσαι) and amplify their interest (τὸ μὲν σφέτερον αὔξουσαι)."[55] The terms in proportion, accordingly, are not body and soul *simpliciter* but, rather, the desires associated with the body and with the intellect for nourishment[56] and for wisdom, respectively. And these do indeed compete. To one engaged in the activity of inquiry, eating and exercising, however necessary, appear as interruptive and distracting; and the activity of inquiry appears the same way to the athlete in training. Each pursuit tends to make itself the center of attention and to eclipse the other. Here we find the context for the univocal notions of relative strength and magnitude that proportion requires. Stronger-and-weaker and greater-and-smaller refer not to the distinct virtues and vices of soul and of body but rather to the power of each of the "two desires"—or, still more closely focused, of the activities that each desire motivates—to "predominate and amplify [its] interest" at the expense of the other. In face of these possibilities, the mark of a good and beautiful life is the maintenance of an even balance or equality between these desires, achieved by the dual cultivation of intellectual and physical fitness. From "ignorance," on the one hand, and "feebleness," on the other, Timaeus says at 88B5–C1, "the one salvation is not to exercise the soul to the neglect of the body or the body to the neglect of the soul, so that the two, each defending itself against the other,[57] will be in equal balance and healthy (ἀμυνομένω γίγνησθον ἰσορρόπω καὶ ὑγιῆ)."

The echoes in 87C–88B of the eidetic order disclosed by the god-given dialectic of the longer way are unmistakable. In the relation of Life to the continuum framed by "soul itself" and "body itself" we cannot help but hear the relation of the single form to the unlimitedly many that dialectic discloses in its initial cuts. And in the opposition of the two desires and the establishment of equal balance required for a good and beautiful human life, we cannot help but hear the imposition of limit upon the unlimited. But the echoes are also fragmentary and incomplete in two important ways. First, even while Timaeus reflects on the well-proportionedness that is normative for "animals" generally, he applies this reflection only to humans. Yet humans are but one kind—or, if we restrict ourselves to the list of six we have gathered so far, but one subkind—of animals. Can we expand our focus from the specificity of human being to the whole array of kinds of animals? And if we can, will this lead us to the limited number of ones that, in some way including human being, stand "between" the single form and the unlimitedly many? Second, as I noted at the outset of this section, there is nothing in Timaeus' treatment of the kinds of animals that plays the role of the Pythagorean ratios in the analysis of musical pitch or of geometric proportion in the account of the elements. As Plato has Timaeus declare, though we can "calculate . . . the less important [proportions]," "the most authoritative and important escape our reckoning." This was also the case with the account of letter-sounds; there it was only by case-by-case distinctions that dialectic disclosed the different regions of the continuum and the different places within them picked out by the forms of the letters. Is the same true for the kinds of animals?

"How the Other Animals Came to Be" (90E–92C): The Continuum of the Kinds of Animals. Timaeus seems to offer his closing account of "how the other animals came-to-be" (90E) almost as an afterthought. The reflections he has just offered, he asserts, "have all but completed the task assigned him at the outset by Critias: he has not only "trac[ed] the history of the universe down to the coming-to-be of human being" (διεξελθεῖν περὶ τοῦ παντὸς μέχρι γενέσεως ἀνθρωπίνης; 90E1–2, recalling 27A), but he has also shown how, by "learning the harmonies and revolutions of the universe," we can bring ourselves into "likeness" with it and thus "achieve the goal of the best life offered by the gods to humans" (90D).[58] But as his laconic phrase indicates, there are "other animals" than the universe, or world-animal, the gods, and humans, and due measure, he says, requires a "brief mention" of them now. For us, attending not only to the ethical-political project Timaeus has begun but also to the thinking along the longer way that underlies it, this "brief mention" is extremely interesting. In its content it provides the resources we need in order to respond to the questions we have raised in listening for a dialectical account of the kinds of animals, and in its surprising comic wit it indicates both the limits and the purpose of the account it suggests. Consider first its content.

To explain "the other animals," Timaeus refers back to the myth of karmic reincarnations he introduced briefly at 42B–D. There he told how souls who fail to master the passions that come with embodiment will receive in subsequent lives body-types that reflect that failure: "In his second birth [such a person] will be given the form of a woman, and if even then he doesn't refrain from vice, he will be transformed again, each time into the sort of wild animal that the corruption of his character resembles" (42B5–C4). Now, at 90Eff., Timaeus is concerned not with the fall of a soul through different incarnations but rather with the different body-types themselves that distinguish the various kinds of animals. But to explain why the gods have chosen to give the animals these body-types, he develops the core idea of the myth. He interprets each body-type with its distinctive capacities as the expression of some degree of failure by a human soul to live the good life, and he ranks the kinds of animals accordingly, constructing a graded series leading away from the normatively human to its greatest corruption. Because the best life is that devoted to "learning" and, so, to "intelligence" (νοῦς) and "wisdom" (φρόνησις), the series leads stage-wise from the "men" (ἀνδρῶν; 90E7) who live the good life to the "very most unintelligent" (τῶν μάλιστα ἀνοητοτάτων; 92B1–2), characterized by "extreme ignorance" (ἀμαθίας ἐσχάτης; 92B7). He traces the series by distinguishing—and drawing further distinctions within the last two of—these four kinds:

1. *"Women" (90E–91D).* According to his reincarnation myth, Timaeus now recalls, those "men" of the first generation who were "cowards" and "lived unjustly" were reborn as women. To provide the female body-type for them, the gods "at that time" had to create the passion for sexual union and the two sorts of genitalia that differentiate male and female.
2. *"The family of birds" (91D–E).* If, as is given comic expression by the "disobedient and self-willed" behavior of the genitalia, the first sort of fallen men "fail to hear their reason" (cf. ἀνυπήκοον τοῦ λόγου; 91B6), a second sort fails to let it speak in the first place, depending rather on their senses; these are the naive astronomers who trust their "eyesight" (ὄψεως; 91D8) to provide "the most reliable proofs," and in apt expression of this they are given feathers and the form of birds.
3. *"The footed that live in the wild": quadrupeds, polypeds, and crawlers (91E–92A).* Even if only empirically, the birdlike men do at least study celestial phenomena; others, having no use for "philosophy" in any form, do not even "gaze up to observe the heavens." These men "no longer tend to the revolutions in their heads" but "instead follow as their leaders the parts of the soul in the chest." Such men are aptly given the body-types of "the footed [animals] that live in the wild," for the loss of upright stature, with the arms dropped to the ground and the head lowered and elongated, is a nice somatic correlate to their abandonment of intelligence in favor of the passions and physical appetites. But quadrupedal shape is only the first and least extreme possibility this change of form can take, and it correlates, therefore, only with the least extreme cases of such abandonment of intelligence. Men still "more mindless" (τοῖς μᾶλλον ἄφροσιν; 92A4) are given still "more [than four] supports" to let them "be drawn more closely to the ground." The limit of this multiplication of feet and shortening of legs, the form the gods give to "the most mindless (ἀφρονεστάτοις) of these men" (92A5), is that of the snake, whose "feet" are, in effect, its "whole body, stretched out along the ground . . . and crawling upon it."
4. *"The fourth kind, that which lives in water": fish and shellfish (92A–B).* Debased as they are, those deserving the snake-form are not the very worst of men. "The very most unintelligent and ignorant" (τῶν μάλιστα ἀνοητοτάτων καὶ ἀμαθεστάτων), Timaeus says, were judged by the gods to deserve shapes that were deprived of "breathing pure air," for "their souls were polluted by every sort of transgression" (92B3–4).[59] Hence the gods removed them from the land, fashioning for them the body-types of "the fourth kind, that which lives in water," and consigning them to breathe "the muddy water of the depths."[60] As with "the footed," so here Timaeus suggests a gradation: "it was from this," he says at 92B6–C1, "that the family of fish and that of all shellfish and whatever lives in water arose: extreme ignorance (ἀμαθίας ἐσχάτης) was allotted in punishment the remotest dwelling-places (ἐσχάτας οἰκήσεις)." If, to the men being punished, underwater is a more remote dwelling-place than in the air or on land, within the underwater realm the seabed is the remotest of all; whereas different kinds of "fish" dwell at all the various depths, "shellfish" are confined to the seabed and mark the limit of the series of kinds of animals to which men can descend.[61]

Thus Timaeus sets "the other animals" into the following series, interpreting the various types as expressing degrees to which "men" can suffer, as Timaeus says in summary, the "loss and gain of intelligence and mindlessness" (νοῦ καὶ ἀνοίας ἀποβολῇ καὶ κτήσει; 92C2–3):

shellfish <—> fish <—> snakes <—> polypeds <—> quadrupeds <—> birds <—> women <—> men
(extreme "loss of intelligence"<——————————————>extreme "gain of intelligence")

Heard in the context of §III. B.1–3, this series presents itself as the determinately partial core of the dialectical account we have been listening for. Most important, it begins to show us what Timaeus' initial fourfold division at 39E–40A neglected: whereas that division focused on the material makeup of each kind, Timaeus now brings to the fore the body-types of each kind and the basic dispositions of soul that correspond with these types; and whereas the fourfold division simply set the kinds apart as if each were self-contained and no more related to any one than to any other of the other kinds, Timaeus now brings out their relative affinities by placing them in a definite sequence and in various proximities on a continuum. What is more, by disclosing this continuum Timaeus in effect makes the partiality of the series conspicuous—and, so, points to the expansions of the series that will recover the whole. The potential extent of the continuum of the "loss and gain of νοῦς" outstrips the list of animal types that Timaeus locates on it. In the direction of "loss," even if the class of shellfish that burrow in the seabed marks the limit of the "ignorance" (ἀμαθία) to which a human soul can sink, the diminution of intelligence as such reaches farther: the extreme on the continuum is marked by plants, for these, having only "the third kind of soul," lack νοῦς altogether (77B5). In the direction of "gain," on the other hand, even the best life that the best man can live is outstripped by the lives of the celestial gods and of the world-animal itself. Precisely how to sort these is too complex a question to explore here, but the first steps are reasonably clear. At 34A2–3 Timaeus characterizes constant rotation in place as "that one of the seven sorts of motion that is most associated with intelligence and wisdom (περὶ νοῦν καὶ φρόνησιν μάλιστα οὖσαν)," and at 40A8–B1 he begins to explain: it is "by" or "with" this motion that "[that which moves] always thinks to itself the same thoughts about the same things (περὶ τῶν αὐτῶν ἀεὶ τὰ αὐτὰ ἑαυτῷ διανοουμένῳ)."[62] Only the world-animal has rotational motion alone. The fixed stars, placed "in the wisdom (φρόνησιν) of the dominant circle [i.e., of the Same]" (40A–B), have constant circular motion as well. And the planets, subject also to the reverse movement of the Different and placed on concentric

circles within it, move in regular but mutually varying and spiral courses. Thus we must rank the life of the world-animal as possessing the highest degree of intelligence and wisdom, the fixed stars next, and the planets third.[63]

Once we expand the series of animals in these ways, we should also see the implied possibility of characterizing the continuum itself in terms of relative opposites. The new kinds to be included expose a manifold abstractness in the notion of "loss and gain of intelligence." On the one hand, the lives of the gods and the world-animal itself express not merely degrees of intelligence that men lack but, more fully, a devotion to it that, though "the most divine of what is within us" is moved by the same "desire" (88B2), we cannot sustain; their motions express a constancy in the exercise of *nous* that we can achieve only rarely and briefly. On the other hand, the nature and lives of plants expose the abstractness of the merely privative ideas of loss of intelligence and mindlessness: as having only "the third kind of soul," plants mark not only the minimal possession of intelligence but also the maximal devotion to the pursuit of food; both their conscious life—the "pleasant and painful sensations that go with appetites" (77B5–6)—and the very shapes of their bodies reflect this pursuit as the positive concern that defines them.[64] Hence, plants mark the extreme predominance of "the desire through the body for nourishment" (88B1–2). Men, in turn, occupy a middle region between these poles. Living the good life involves physical as well as spiritual "health"; we must maintain an "equal balance" (ἰσορροπία; 88B7) between body and soul by distributing our energies between the exercise of our reason in inquiry and the exercise of our bodies in gymnastic. Thus we seek to gratify both the desire for wisdom that predominates in increasing degrees in the lives of the celestial gods and the world-animal and the desire for nourishment that predominates—again in increasing degrees, as is physically expressed by the stage-by-stage way in which, in the progression along the continuum toward plants, the spatial orientation of the body shifts from upright to forward-leaning to prone to being headed downward into the earth—in the lives of the "lower" animals.

To these reflections it remains only to add our earlier recognition of the single form as Life, τὸ ζῆν, and we can make out—with one major reservation, to be considered shortly—all the essential features of the eidetic order sought by the god-given method of dialectic. As we first glimpsed in our discussion of 87C–88B, Life presupposes, as the unlimited plurality of its possible instantiations, a continuum of the possible proportions between "body itself" and "soul itself"—that is, as we may again spell out, between lives in which, at one extreme, "the desire through the body for nourishment" predominates over "the desire [through reason] for wisdom" to the maximal degree and lives in which, at the other extreme, "the desire for wisdom" predominates over "the desire for nourishment" to the maximal degree. For its actual instantiation, in turn, Life requires the instantiation of a limited plurality of forms, each of which selects a distinct region on the continuum. These regions, in turn, *are* ranges of the balances of body and soul, and as such they

set normative conditions for each kind of animal. Precisely how these balances might be "calculated," Timaeus has acknowledged, we cannot say; "the most authoritative and important of proportions," they "escape our reckoning" (ἀλογίστως ἔχομεν; 87D1). We have nothing like the Pythagorean ratios in music to guide us. Hence, as Timaeus has done with his karmic myth and as Socrates indicated in outlining the account of letter-sounds in the *Philebus*, we must be content to establish the relative places that the forms pick out on the continuum by distinguishing and comparing cases. Here, to sum up diagrammatically, is the eidetic order that has emerged:

the single form:

τὸ ζῆν (Life)

/ / / / | \

plants fish the footed birds (humans) gods

the limited number of "ones":

| / \ / | \ | / \ / | \

plants shellfish snakes birds women planets

& fish & polypeds & men & stars

& quadrupeds & world

the continuum (i.e., the unlimited) and the regions which these "ones" pick out on it:

(—)(—)(——)(—)(——)(——)(——)(——)(——)(———)(————)(–)

|———————————————————————————————————|

body > soul	body = soul	body < soul
(i.e., desire for nourishment > desire for wisdom)	(i.e., desire for nourishment = desire for wisdom)	(i.e., desire for nourishment < desire for wisdom)

Let me close with two sets of observations that converge in a surprising way. The first concerns this vision of eidetic order; the second concerns the karmic myth that has been our point of departure in recovering it.

First, what we have recovered clearly does not yet contain a satisfactory enumeration of the limited number of "ones" that stand between the single form and the unlimited many. A comparison with the accounts of Pitch, Letter-sound, and the Bodily makes this obvious; in each of those, dialectic arrives at "ones"—the pitches that belong together in modes, the letter-sounds that make up the alphabet, and the four elements—that are commensurate with one another, determinate in their instantiation, and fit for appropriate sorts of combination and interplay. In the account of animals, by contrast, kinds like plants and birds have not yet been differentiated as, albeit in ways that are themselves very provisional, fish and the footed and gods have; and in the case of humans, differentiation appears to have gone too far, cutting beneath the unity of the kind and breaking the species into parts, "men" (ἀνδρῶν; 90E7) and

"women" (γυναῖκες; 90E8), that cannot stand alone. Evidently, the work of dialectic is far from finished; quite the contrary, it requires at the very least a host of special biological and astronomical studies.

Second, there is a provocative humor in Timaeus' karmic myth,[65] all the more so because it is double-edged. There is Aristophanic hilarity in the interpretations of birds as naively empirical astronomers, of polypeds and crawlers as men in thrall to their hungers, of shellfish as the terminally oblivious; these are comic epiphanies. But the jokes rebound. The interpretation of animal forms as expressions of human depravity takes the human as the measure of the animal, and such anthropocentrism is itself a form of obliviousness. To laugh deeply, then, is to question the karmic myth itself. This rebound puts into question especially—if it were not already suspect to us[66]—the opening move of the myth. Can we help but smile at the vivid image of the phallus as an "unruly animal with a mind of its own" that "tries to overpower all else with its frantic desires" (ἀπειθές τε καὶ αὐτοκρατὲς . . . , πάντων δι' ἐπιθυμίας οἰστρώδεις ἐπιχειρεῖ κρατεῖν; 91B5–7)? But does this image not give the lie to the story it is part of, the story of how the gods fashioned the *female* form as the reincarnation befitting men unable to master their passions? The unruly phallus, which the gods fashioned at the same time that they fashioned the female genitalia, makes the male form eminently suitable.

The deep target of both these strands of humor is the mistake of taking oneself as the standard for the other and the whole; both a male sexist interpretation of the female and, analogously, an anthropocentric interpretation of "other animals" are exposed. But how, positively, are such provincialisms to be overcome? It is here that the two sets of observations seem to converge. To escape projecting the human as measure for "the other animals" and the male as measure for the human, Plato seeks a higher measure for the human and the male themselves; and if our reconstruction is well aimed, he seeks in the directions both of the soul and of the body, reflecting on the desire for wisdom as the gods live it and on the desire for nourishment as it is exhibited in plants. These measures provide the frame of reference for an inquiry that seeks the true whole to which the human belongs. But, as we observed in noticing the uneven character of the articulation of the kinds of animals, the manifold studies that this inquiry requires are, for the most part, tasks for the future; they belong to the long-term journey along the "longer way."

Notes

I owe thanks to a number of colleagues for discussion of the *Timaeus* and critical suggestions regarding various of the issues treated in this essay—especially Michael Anderson, Brad Bassler, Luc Brisson, Ed Halper, Burt Hopkins, Drew Hyland, Rachel Kitzinger, Richard Parry, Gretchen Reydams-Schils, and Ken Sayre. I have benefited from questions raised about earlier versions presented at the University of Georgia, University of Notre Dame, Vassar College, and the October meeting of the American Plato Association.

1. This is, of course, G. E. L. Owen's question in "The Place of the *Timaeus* in Plato's Dialogues," in *Studies in Plato's Metaphysics*, ed. R. E. Allen, International Library of Philosophy and Scientific Method (London: Routledge & Kegan Paul/New York: Humanities Press, 1965), 313–38. I cannot accept Owen's own response, to redate the *Timaeus* as a middle dialogue, because he is overruled by more recent stylometric research; see Ian Mueller, "Joan Kung's Reading of Plato's *Timaeus*," in *Nature, Knowledge, and Virtue: Essays in Memory of Joan Kung* [= *Apeiron* 22], ed. T. Penner and R. Kraut (Edmonton: Academic Printing and Publishing, 1989), 1–27; G. R. Ledger, *Re-counting Plato* (Oxford: Oxford University Press, 1989); and Leonard Brandwood, *The Chronology of Plato's Dialogues* (Cambridge: Cambridge University Press, 1990). Nor, more deeply, do I construe the problem as a conflict between two positions Plato takes; the presumption of orthodox developmentalism that the dialogues give us the more or less straightforward expression of Plato's views is blind to the structural irony of dialogue form. The conflict is between the positions that Plato has his characters Parmenides and Timaeus take, and our first line of response should be an interpretation, on the one hand, of the functions of these positions in their distinct dialogical contexts and, on the other, of the philosophical and pedagogical purposes motivating Plato to construct these dialogical contexts in the first place.

2. The best sustained explication and defense of the likeness/model simile is Richard Patterson, *Image and Reality in Plato's Metaphysics* (Indianapolis: Hackett, 1985).

3. How might Socrates have resisted this line of reasoning? And why doesn't he? This is not the place to go into the vast literature on these questions. My own view, explicated in *Plato's "Parmenides": The Conversion of the Soul* (Princeton: Princeton University Press, 1986; repr. State College: Pennsylvania State University Press, 1991), is that Socrates ought to have denied that a likeness (i.e., an image) stands in a relation of similarity with that of which it is a likeness and, conversely, ought to have asserted the difference in kind of form from participant. His failures are, on my reading, provocations to the reader to see these points and prepare us for the hypotheses, which, setting simile aside, articulate conceptually the difference in kind of form from participant and, paradoxically, the immanence this enables. Cf. Kenneth Sayre's rich *Parmenides' Lesson: Translation and Explication of Plato's "Parmenides"* (Notre Dame: University of Notre Dame Press, 1996).

4. See Edward Lee, "On the Metaphysics of the Image in Plato's *Timaeus*," *Monist* 50 (1966): 341–68; R. E. Allen, *Plato's "Parmenides"* (Minneapolis: University of Minnesota Press, 1983), esp. 180, 290; Rafael Ferber, "Why Did Plato Maintain the Theory of Forms in the *Timaeus*?" in *Interpreting the "Timaeus-Critias,"* ed. T. Calvo and L. Brisson, International Plato Studies 9 (Sankt Augustin: Academia Verlag, 1997), 179–86.

5. For a two-level reading that is complementary to what I shall offer here, see Daryl M. Tress, "Relations and Intermediates in Plato's *Timaeus*," in *Plato and Platonism*, ed. J. M. Van Ophuijsen, Studies in Philosophy and the History of Philosophy 33 (Washington, D. C.: Catholic University of America Press, 1999), 135–62.

6. This is Allen's helpful notion in *Plato's "Parmenides,"* 197.

7. But this is not to say that the conversation of the day before should be taken to be either the one which Socrates reports in the *Republic* (this has an entirely different cast of characters) or the one to which this report itself belongs (the dates of the religious festivals alluded to in the two dialogues make this impossible). See Francis Cornford, *Plato's Cosmology,* International Library of Psychology, Philosophy and Scientific Method (New York: Harcourt, Brace/London: Kegan Paul, 1937), 4–5; Diskin Clay, "Gaps in the 'Universe' of the Platonic Dialogues," in *Proceedings of the Boston Area Colloquium in Ancient Philosophy 3 (1987),* ed. J. Cleary (Lanham, Md.: University Press of America, 1988), 143–46. The contrast of the *Republic* and Socrates' summary in the *Timaeus* is so striking that it has led some—most recently, Holger Thesleff, "The Early Version of Plato's *Republic*," *Arctos* 31 (1997): 149–74—to search for a distinct earlier version of the *Republic* that lacked its turn to metaphysics.

8. See Thérèse-Anne Druart, "The *Timaeus* Revisited," in *Plato and Platonism,* ed. J. M. Van Ophuijsen, Studies in Philosophy and the History of Philosophy 33 (Washington, D. C.: Catholic University of America Press, 1999), 163–78, for the argument that, to put the matter in terms of the different levels of insight represented by figures in the just city of the *Republic*, "the intended audience [of the *Timaeus*] is not the philosopher-king so conspicuously absent from the summary of the *Republic* that introduces [it] but the auxiliaries who are the very focus of this summary" (164).

9. Gretchen Reydams-Schils ("Socrates' Request: *Timaeus* 19B–20C in the Platonist Tradition," *The Ancient World* 32.1 [2001]: 39–51) suggests a darker irony here. She reads Critias' claim to translate Socrates' "myth" "into the true" as a reductionist suppression of Socrates' metaphysical distinction of forms from the temporally determinate. In Critias' acknowledgment in the *Critias,* moreover, that he is in possession of written notes on the Egyptian versions of the Greek names involved in the Atlantis story, she finds evidence that Critias dissembles in the *Timaeus* when he stresses the efforts he has made to retrieve the story from his earliest memories, and this moves her to suggest, taking up an observation by Luc Brisson (*Le Même et l'Autre dans la structure ontologique du "Timée" de Platon,* International Plato Studies 2 [3d ed.; Sankt Augustin: Academia Verlag: 1998], 332), that Plato intends the *persona* "Critias" here to "evoke the shadow" of his grandson, the "Critias" who led the Thirty Tyrants in 404–403 and whom Plato puts on stage in the *Charmides.*

10. As Diskin Clay ("The Plan of Plato's *Critias,*" in *Interpreting the "Timaeus-Critias,"* ed. T. Calvo and L. Brisson, International Plato Studies 9 [Sankt Augustin: Academia Verlag, 1997], 49–54) and, independently, Laurence Lampert and Christopher Planeaux ("Who's Who in Plato's *Timaeus-Critias* and Why," *Review of Metaphysics* 52 [1998]: 87–125) argue, there is room for rich Platonic irony here too. The tale of ancient Athens' repulsion of imperialist Atlantis repeats in mythical form early fifth-century Athens' greatest moments, her repulsions of the Persian invasions in 490 B.C. at Marathon and in 480 B.C. at Salamis. But it also reminds one of Syracuse's repulsion of imperialist Athens in 415–413 B.C., as the presence of the *persona* "Hermocrates," the Syracusan statesman and soldier most responsible, cannot help but assure. Clay (52 n. 6) thinks that the "Critias" of the *Timaeus* is the leader of the Thirty also put on stage in the *Charmides.* Lampert and Planeaux (95–97), reflecting on the length of time required by the complex chronology at *Timaeus* 21B–D, disagree, to my mind convincingly. But as Reydams-Schils ("Socrates' Request") observes, these alternatives need not be thought mutually exclusive: Lampert and Planeaux may be right at the level of the letter, Clay at the level of the spirit, of the text.

11. At 47E4 Timaeus refers to the Demiurge's products as "the things crafted by intellect" (τὰ διὰ νοῦ δεδημιουργημένα). Does Plato thus suggest that the Demiurge is identical to νοῦς (intellect) as such? While this option remains open to the thoughtful reader, Timaeus' language does not positively invite us to think of "intellect" as a separately subsisting disembodied principle. On the contrary, at 30B he has the Demiurge himself reason that "it is impossible for something (τῳ) to come to possess intellect apart from soul" and, so, deem it appropriate to "construct the world" by "put[ting] intellect into soul and soul into body." In beginning from τῳ (something), Plato has Timaeus' argument appeal indirectly to the reader's inclination to take the individual, an ensouled body or embodied soul, as basic.

12. Robert Turnbull (*The "Parmenides" and Plato's Late Philosophy* [Toronto: University of Toronto Press, 1998], 149) suggests the translation "receiver," which nicely shifts focus from thing to function and, so, does better justice to the unthingly nature of the medium; but Plato's use of ὑποδοχή seems designed to confront the reader with the difficulty of thinking of this nature in a way that does not violate it, so for its very problematicness on this score I have stayed with the traditional "receptacle."

13. See Kenneth Sayre's discussions of the inadequacy of these expressions in *Plato's Late Ontology: A Riddle Resolved* (Princeton: Princeton University Press, 1983), 246–55; and in "The Multilayered Incoherence of Timaeus' Receptacle" in this volume. For suggestive reflections on Timaeus' standpoint and rhetoric in this passage, see Jacob Klein, *A Commentary on Plato's "Meno"* (Chapel Hill: University of North Carolina Press, 1965), 198–99; I owe thanks to Burt Hopkins for alerting me to this passage. In a different key, Jacques Derrida ("Chora," trans. Ian McCloud, in Jacques Derrida and Peter Eisenman, *Chora L Work* [New York: Monacelli, 1997], 15–32) and John Sallis (*Chorology: On Beginning in Plato's "Timaeus"* [Bloomington: Indiana University Press, 1999]) stress that the receptacle stands outside the distinction of form and sensible and resists clarification by means of it.

14. The ultimate goal Socrates projects is the dialectical understanding of the Good. Because, according to *Republic* 509B, the Good is somehow the basis for both the knowability and the being of the forms, the understanding of the Good is cultivated indirectly at each stage of the longer way—most fully by the dialectical understanding of the good life that the *Philebus* makes possible (see 4c in the outline).

15. The *Sophist* and the *Statesman,* a pair (see *Statesman* 257A–258A), are preceded by the *Theaetetus* and form a trilogy with it. See the closing words of the *Theaetetus* and the opening words of the *Sophist* for the dramatic linking. For the role of the *Theaetetus* in the longer way, see my "Unity and Logos: A Reading of *Theaetetus* 201C–210A," *Ancient Philosophy* 12 (1992): 87–110.

16. See my "Dialectical Education and 'Unwritten Teachings' in Plato's *Statesman,*" in *Plato and Platonism,* ed. J. M. Van Ophuijsen, Studies in Philosophy and the History of Philosophy 33 (Washington, D. C.: Catholic University of America Press, 1999), 231–36 and figs. 7–8 (on 240–41).

17. I am now at work on a study explicating these claims regarding the *Philebus.* For the moment, note how *Republic* 443D–E (443D7 in particular), especially in light of our treatment, in this section, of the exemplary dialectical account of musical pitch at *Philebus* 17C–E, seems to anticipate such an alternative.

18. See my "'Unwritten Teachings' in the *Parmenides*," *Review of Metaphysics* 48 (1995): 591–633.

19. See *Philebus* 25C9–10, where μεῖζον καὶ σμικρότερον are included among many cases of τὸ ἄπειρον.

20. This is Aristotle's phrase; *Physics* 209b14–15.

21. The task of seeking these teachings in Plato's writings was first pursued by Sayre's ground-breaking *Plato's Late Ontology,* which finds these teachings present especially in the *Philebus.*

22. I have, however, studied these stages in a number of essays. For 1, see "Figure, Ratio, Form: Plato's Five Mathematical Studies," in *Recognition, Remembrance and Reality: New Essays on Plato's Epistemology and Metaphysics* [= *Apeiron* 32.4], ed. M. McPherran (Edmonton: Academic Printing and Publishing, 1999), 73–88. For 2, see *Plato's "Parmenides."* For 3b, see *The Philosopher in Plato's "Statesman"* (The Hague: Nijhoff, 1980), chap. 2. For 4a and 4b, see "The God-Given Way: Reflections on Method and the Good in the Later Plato," in *Proceedings of the Boston Area Colloquium in Ancient Philosophy 6 (1990),* ed. J. Cleary and D. Shartin (Lanham, Md.: University Press of America, 1991), 323–59. For 4c, see "Dialectical Education."

23. Focusing on this stage of the longer way brings the *Philebus* and the *Timaeus* into encounter; in thinking this through, I have benefited from the different approaches of Luc Brisson, who uses the four kinds in *Philebus* 23C–27C to frame his reading of the *Timaeus* in *Le Même et l'Autre,* and the developmentalist analysis offered by Kenneth Sayre in "The Role of the *Timaeus* in the Development of Plato's Late Ontology," *Ancient Philosophy* 18 (1998): 93–124.

24. That the dialectician seeks forms is indicated by the fact that "three" (τρεῖς; 16D4) is feminine, repeating the gender of "a single form" (μίαν ἰδέαν; 16D1), and so refers back to ἰδέαν and implies ἰδέας as the noun it modifies.

25. See J. C. B. Gosling, *Plato: "Philebus"* (Oxford: Oxford University Press, 1975), 154ff., for a broader list.

26. Ἔχον should be translated with an active sense as "provides" or "gives." That which "has" (in the usual sense of "receives" and "is subject to") limit is the third kind, in which the unlimited *is limited by* the imposition upon it of that which *provides* limit.

27. Illuminating studies of this controversial passage are Gisela Striker, *Peras und Apeiron: Das Problem der Formen in Platons "Philebos"* (Göttingen: Vandenhoeck & Ruprecht, 1970); Gosling, *Plato: "Philebus,"* 183–206; and Sayre, *Plato's Late Ontology,* chap. 3.2.

28. Note that by having Socrates include πλέον καὶ ἔλαττον and μεῖζον καὶ σμικρότερον as cases of the unlimited, Plato requires us to understand μᾶλλόν τε καὶ ἧττον in a manifoldly general way. It cannot be taken to mean more in number as opposed to magnitude, for it applies equally to both. And μᾶλλον and ἧττον must be understood as second order characters with their senses expanded accordingly: though paradoxical to hear, nonetheless what is ἔλαττον is "more (μᾶλλον) few" than what is πλέον, and what is σμικρότερον is "more (μᾶλλον) small" than what is μεῖζον, and so on.

29. Note that if we begin with the Pythagorean ratios, there will be *two* sets of ratios involved in the selection of notes from the continuum. In establishing the relations in pitch (more or less high, more or less low) between the notes in a scale, we also establish, within each of the notes, the balance of high and low (more high than low, more low than high) that is appropriate to it. Thus, the set of ratios that do the first job implies a distinct set of ratios that do the second, and vice versa. For example, the Pythagorean ratio 1 : 2 establishes the note that is, within the span of the double octave (1 : 4), ὁμότονον (even-toned), that is, 1 : 1 in its balance of high and low. I owe thanks to my colleague in mathematics at Vassar College, Prof. John McCleary, for showing me that we can translate back and forth between these sets of ratios by use of what David Fowler (*The Mathematics of Plato's Academy* [Oxford: Oxford University Press, 1987], 42ff.) calls "the *Parmenides* proposition."

30. Notably Eratocles, according to M. L. West (*Ancient Greek Music* [Oxford: Oxford University Press, 1992], 227), who assigns him the date 422. Andrew Barker (*Greek Musical Writings,* vol. 2: *Harmonic and Acoustic Theory* [Cambridge: Cambridge University Press, 1989], 15) places Eratocles' work "somewhere within a decade or two of the year 400."

31. We shall give the names for the other six modes in the diagram that follows. Note that each mode could appear in each of three genera, the enharmonic, diatonic, and chromatic, with the diatonic and chromatic subject to still further variations, called colorings; variations at these two levels were achieved by changing the intervals between the notes internal to the fourths or tetrachords. West (*Ancient Greek Music,* 164) assumes that Eratocles worked out his system of species of the octave in the enharmonic because, as he reports, "Aristoxenus [in *Harmonics* 1.2; 2.35] says that theoreticians before him had concerned themselves exclusively with this genus." Important exceptions to Aristoxenus' comments, however, were the Pythagoreans Philolaus, who worked out ratios for the octave scale in the diatonic genus, and Archytas, who worked out ratios for tetrachords in all three genera. See Barker, *Greek Musical Writings,* 2.37–38, 46–52. And Plato, though he does not have Timaeus name the genus he has in mind, appears to be working with the diatonic when, at *Timaeus* 36A–B, he has Timaeus lay out ratios for the structure of the World Soul and "fill all the 4 : 3 intervals," that is, all the fourths or tetrachords, with intervals of 9 : 8, 9 : 8, and 256 : 243. On this account I shall space the intervals in my diagram according to these latter ratios. But I don't think there is any reason, in the context of the *Philebus,* to privilege these numbers; to bring out *the sort of knowledge* that Plato took the music theorist to have, we could use any of the numbers proposed for any of the genera and colorings.

32. Recall the feminine τρεῖς at 16D4, discussed in n. 24 above; and see εἴδη at 19B2; 20A6, C4.

33. Cf. Erik Ostenfeld, "The Role and Status of Forms in the *Timaeus*," in *Interpreting the "Timaeus-Critias,"* ed. T. Calvo and L. Brisson, International Plato Studies 9 (Sankt Augustin: Academia Verlag, 1997), 174–76. But as I have argued elsewhere, forms should be distinguished from ratios, even as we closely relate the two, for (1) forms *are not*—and ratios are—"mathematicals," and (2) forms are *the sources of* the ratios imposed upon the continuum; see Miller, "Unwritten Teachings," 626.

34. The term στοιχεῖον has both of these senses, and this perfectly expresses Socrates' point: the very concept of "letter" implies that each instantiation of it is fit, as an "element," for combination with others. See H. Koller, "Stoicheion," *Glotta* 34.3/4 (1955): 161–74.

35. See Robin Waterfield, *Plato: "Philebus"* (New York: Penguin, 1982) 63 n. 2. Unfortunately we lack historical records of any actual analysis laying out the letter-sounds in sequence; we have nothing analogous to the reports of the musicological

work done by Eratocles, Philolaus, and Archytas. Prof. Rachel Kitzinger, my colleague in Classics at Vassar College, tells me that an unambiguous series might be constructed if we were allowed to add to the relative release and cutting-off of breath the consideration of the relative locations, ranging from the back of the throat to the front of the mouth, where the sounds are produced. This is particularly interesting, as we will see, in relation to the first of the two continua we shall trace in the *Timaeus*, for there we shall find a conjunction of pairs of opposites framing the continuum.

36. The requirements of English word order make it difficult to convey the semantic elegance of Plato's Greek here. The sentence begins Σωματοειδὲς δὲ δὴ καὶ ὁρατὸν ἁπτόν τε. Thus Plato stresses the predicate, Σωματοειδές, by beginning the sentence with it; pairs ὁρατόν closely with ἁπτόν by linking them by means of enclitic τε; and so, both by word order and the contrast of καί with τε, gives καί explicative force.

37. These points will be reinforced shortly when Timaeus inserts air and water as means between fire and earth. Air and water are, in diminishing degrees, transparent to light and, in increasing degrees, solid.

38. See Cornford, *Plato's Cosmology,* 45–50.

39. See S. K. Strange, "The Double Explanation in the *Timaeus*," *Ancient Philosophy* 5 (1985): 25–39.

40. Time proper, the measure-giving motion of the heavenly bodies, is only fashioned by the Demiurge along with the fashioning of the world (37C–D), and in the temporal sequence projected by Timaeus' narrative, the disorderly motions in the receptacle preexist this fashioning (53A7; and note τότε in 53A2, referring back to 52D4); it is these motions upon which the Demiurge, in first fashioning the world, imposes order.

41. With my "so" I am trying to express the force of the use of the aorist passive participle in Timaeus' πρὶν καὶ τὸ πᾶν ἐξ αὐτῶν διακοσμηθὲν γενέσθαι at 53A7.

42. On the Milesian association, seminal for all the Presocratics, of the hot, the bright, and the rare in correlation with their associated opposites, the cold, the dark, and the dense, and on the recognition of fire as the paradigm case of the former, see Charles Kahn, *Anaximander and the Origins of Greek Cosmology* (New York: Columbia University Press, 1960), 159–63, also 101–2. As Pat Curd has pointed out to me in conversation, Parmenides brings this to focus in associating fire with lightness in his proem and Doxa. Note how, presumably alluding to the Milesian associations, he has the goddess take ἐλαφρόν (light [in weight]) (B8.57) as a feature of fire and oppose to it the "dense and heavy" character of "dark night" (B8.59).

43. This leaves aside, of course, the dodecahedron, which Timaeus reserves as the regular solid that most befits the body of the cosmos as a whole. On the relation of the dodecahedron and the sphere, see Cornford, *Plato's Cosmology,* 218–19.

44. The word ἴχνη is commonly used of footprints.

45. See M. F. B. Burnyeat, "World-Creation as an Exercise of Practical Reason in Plato's *Timaeus*" (paper read at the conference "Plato's *Timaeus* as Cultural Icon," University of Notre Dame, March 30–April 1, 2000).

46. See Cornford, *Plato's Cosmology,* 222 n. 1.

47. How should the relation of these two passages be understood? In the first Timaeus speaks of water, as such, and gives an account of the effect upon it when fire, having penetrated it, is then expelled from it. In the second he speaks of "water that is mixed with fire" (τὸ πυρὶ μεμειγμένον ὕδωρ; 59D4)—that is, of the compound of the two—and describes the same effect as arising, now, from the "separation-off [from it] of fire and air" (πυρὸς ἀποχωρισθὲν ἀέρος τε; 59D7). Is there no difference between external relations between different elements and internal relations between different elementary components of a compound?

48. Timaeus makes a very interesting aside here. Comparing copper and gold, he says that copper "is in one way denser (πυκνότερον) than gold," namely, in that it contains earth and is made "harder" by it, and is "in another way lighter (κουφότερον)," namely, in that it has large gaps within itself. This is the one and only passage I have found in which the dense and the heavy are pried apart, with the denser being lighter and the heavier being rarer. Does Plato implicitly call into question the pairings of rare with light, and of dense with heavy, that are asserted at 53A1–2, or does he—offering, in effect, an exception that proves the rule—underscore the reliance of Timaeus' analysis everywhere else on these pairings? In any case, Timaeus' aside shows that it is in terms of these pairings that he takes his bearings in analyzing material stuffs.

49. Due to limits of space and time, I have restricted myself here to Timaeus' treatments of the subkinds of the elements, not venturing into his associated analyses of compounds (59D–60B and 60E–61C) and perceptual properties (61C–69A). I am struck by the way in which he appears to lay out the compounds of (1) water and fire (the "saps"; 59E–60B) and (2) earth and water (61A–C) as series on continua and, again, by the way in his account of each set of perceptual properties he identifies pairs of relative opposites and, so, continua of their shifting proportions. To explore these passages with an eye, above all, to discovering how they fit together is a huge and exciting task. One undertaking it should consult the commentary of Luc Brisson (*Le Même et l'Autre*, 390), noting especially his chart integrating the accounts of kinds and compounds. See also L. Brisson and F. Walter Meyerstein, *Inventing the Universe: Plato's "Timaeus," the Big Bang, and the Problem of Scientific Knowledge,* SUNY Series in Ancient Philosophy (Albany: State University of New York Press, 1995), 53–54.

50. I have focused in what follows on the problems of this sorting as a dialectical division. But note what would also have been striking to those working on the longer way, the exaggeratedly doxic rhetoric of this passage: "reason *sees*" the forms, which, hence, are represented as *quasi*-visible individuals. Plato has Timaeus' language make this conspicuous when, after referring to the forms as ἰδέας at 39E8, Timaeus then says that the Demiurge—now to retranslate 40A2–4 more literally—"makes most of the form (τὴν πλείστην ἰδέαν) of the divine out of fire, so that it might be the brightest and most beautiful to see (ἰδεῖν)."

51. See Richard Parry, "The Intelligible World-Animal in Plato's *Timaeus*," *Journal of the History of Philosophy* 29 (1991): 13–32.

52. Cornford (*Plato's Cosmology,* 303 n. 1) argues persuasively that by τῆς ὑφ' ἑαυτοῦ κινήσεως at 77C4–5 Timaeus means not self-motion in general but the narrower notion of self-locomotion.

53. See Donald Zeyl, *Plato: "Timaeus"* (Indianapolis: Hackett, 2000), lxxxi: "They count, if only very minimally, as 'animals.'" This more closely measured sentence should trump the final clause in 71 n. 87 (= *Plato: Complete Works*, ed. J. Cooper [Indianapolis: Hackett, 1997], 1277 n. 41): "They are not animals."

54. These last three words are Cornford's felicitous rendering in *Plato's Cosmology,* 350.

55. The phrase *amplify their interest* is Zeyl's felicitous rendering in *Plato: "Timaeus,"* 84.

56. I translate τροφή as "nourishment" in order to keep in view that it includes exercise as well as food. This is made clear in the example of the man who lets his desire for it exceed his desire for wisdom by devoting himself excessively to gymnastics. Compare *Statesman* 288E–289A. Plato has in mind not the man who merely overeats and becomes "great" in the sense of overweight but rather the man who, while eating and exercising so as to make himself a powerful physical specimen, neglects the development of his intellect.

57. Ἀμύνεσθαι is often used to convey retaliation; thus each would be thought to defend itself against the prior aggression of the other. Taken in this way, the word gives vivid expression to the intrinsic relativity of relative opposites.

58. For the centrality of the goal of godlikeness to Timaeus' discourse, see Druart, "*Timaeus* Revisited"; David Sedley, "The Ideal of Godlikeness," in *Plato 2,* ed. G. Fine (Oxford: Oxford University Press, 1999), 316–24; and John Armstrong, "Plato on Godlikeness as the Final End" (unpublished essay).

59. "Transgression" is both Cornford's (*Plato's Cosmology,* 358) and Zeyl's (*Plato: "Timaeus,"* 88) effort to render the interesting word πλημμέλεια (92B3), the focal sense of which is "mistake in music, false note" (LSJ 1418), that is, violation of the normative orders of pitch and tempo that make for harmonious and rhythmic sound.

60. This last phrase is Cornford's felicitous rendering of ὕδατος θολερὰν καὶ βαθεῖαν (92B5) in *Plato's Cosmology,* 358.

61. Thus also A. E. Taylor (*A Commentary on Plato's "Timaeus"* [Oxford: Clarendon, 1928], 645), who says (in enjoyment of the humor he finds in the myth), "the shellfish, &c., are the worst sinners and therefore live farthest from pure air."

62. On this question see especially Edward Lee, "Reason and Rotation: Circular Movement as the Model of Mind (*Nous*) in the Later Plato," in *Facets of Plato's Philosophy,* ed. W. H. Werkmeister (Assen: Van Gorcum, 1976), 70–102.

63. I must leave for another occasion the question of whether the Demiurge should also be ranked on this scale, for this raises the larger question, noted in §I, of how literally we are to interpret this figure. If we take the Demiurge as a living being in "his" own right, "he" would have a place on the continuum; but this would immerse us in all the paradoxes discussed by, among others, Matthias Baltes, "Γέγονεν (Platon *Tim.* 28B7): Ist die Welt real entstanden oder nicht?" in *Polyhistor: Studies in the Historiography of Ancient Philosophy Presented to J. Mansfeld,* ed. K. A. Algra, P. W. van der Horst, and D. T. Runia, Philosophia Antiqua 72 (Leiden: Brill, 1996), 76–96; and John Dillon, "The Riddle of the *Timaeus:* Is Plato Sowing Clues?" in *Studies in Plato and the Platonic Tradition: Essays Presented to John Whittaker,* ed. M. Joyal (Aldershot: Ashgate, 1997), 25–42. If, following the ancient lead of Speusippus and Xenocrates, we take the Demiurge to be a symbol for the bodiless principle of νοῦς, "it" would transcend the category of life, which, in the *Timaeus* at least, implies embodiment, and so would not have a place on the continuum. If, reading the *Timaeus* in light of *Philebus* 28D–30D, we take the νοῦς that the Demiurge symbolizes to be that of the world-animal, then we have already given it a place on the continuum.

64. Timaeus' image of humans as inverted plants, "grown not from the earth but from the sky" with "the head as a root" (90A6–8), appears to play on and, so, to presuppose Democritus' image of plants as inverted humans; see Cornford, *Plato's Cosmology,* 357 n. 3. We find the idea preserved in Aristotle, *Parts of Animals* 686b32ff.; see Taylor, *Commentary on Plato's "Timaeus,"* 643.

65. Taylor stresses this—but to excess, missing the point of the irony. See *Commentary on Plato's "Timaeus,"* 635, 636, 640–42, 644.

66. It is surprising to hear Timaeus, who has agreed to give the prelude to the tale in which Socrates' just city will be portrayed in action and who earlier noted with apparent approval (taking 17C–19B in light of 17C4–5) Socrates' proposal that "the natures [of women] be brought into equality and correspondence with men" (18C1–2), now relegate women to the status of failed males. If it were really proper to women as women to be "cowardly and unjust" (90E7), would it make sense that "one should give to them all (πάσαις) of the civic occupations [of the guardians], both those concerned with war and the rest concerned with [the guardians'] way of life (τὰ ἐπιτηδεύματα πάντα κοινὰ κατά τε πόλεμον καὶ κατὰ τὴν ἄλλην δίαιταν)"? Taken at face value, these passages are strikingly discordant. If, however, we find in Timaeus' comments at 90Eff. the same sort of irony that is in play in his comic exposure of anthropocentrism in the rest of the karmic myth, then the passages come back into concord: the male is no more the measure of the human than is the human of the animal.