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REASONS AND CAUSES IN THE *PHAEDO*¹

THERE is a passage in this dialogue which has led many scholars—the great majority of those who have translated or discussed it in detail—to think that Plato's Forms are meant to be causes. This is the methodological and metaphysical preamble (95E-105C) to the final argument for the immortality of the soul. The importance of this passage could hardly be exaggerated: as much is to be learned from it about Plato's metaphysics, epistemology, and philosophy of science as from any other text of equal length in his corpus. But it is also one of the most perplexing. Scholars who have not confessed its difficulty have evidenced this difficulty just the same in the wild diversity of the interpretations they have put on it. According to Eduard Zeller, Plato teaches here that the Ideas are meant to be formal, efficient, and final causes all rolled into one.² Paul Shorey, at the other extreme, maintained that when Plato speaks of the Ideas as *aitiai* he is offering "only a tautological logic . . . a consistent and systematic substitution of the logical reason for all other forms of cause."³

¹ An earlier version of this paper was delivered at Michigan State University as an Arnold Isenberg Lecture, and other drafts have been read elsewhere. I acknowledge with gratitude diverse criticisms which have helped me improve the paper, and most particularly those given me by Professors Terry Penner and Richard Sorabji, whose detailed and penetrating queries have prompted revisions which have clarified and strengthened the argument, though perhaps without fully meeting their objections. A debt of another sort I owe to the Center for Advanced Study in the Behavioral Sciences at Stanford where the present draft was completed.

² "In dieser ganzen Auseinandersetzung [with the physicists in our passage] wird nun zwischen der begrifflichen, der wirkenden und der Endursache nicht bloss nicht unterschieden, sondern alle drei werden deutlich genug für Ein und dasselbe erklärt." Zeller, *Philosophie der Griechen*, 5th ed. (Leipzig, 1922), II, i, 687, n. 1. I shall not criticize this statement directly, but my reasons for rejecting it will become clear as I proceed. I shall follow the same policy with respect to other views with which I cannot agree. Limitations of space will prevent me from engaging in controversy except in so far as I find this essential for the elucidation and support of the interpretations I propose.

³ *What Plato Said* (Chicago, 1933), p. 179. Zeller's contrary interpretation Shorey had already rejected in "The Interpretation of the *Timaeus*," *American Journal of Philology*, 9 (1888), 395 ff. (at p. 406) and still earlier in his Munich

More recently, commentators have not hesitated to take their own perplexed reading of this text as evidence of unclear thinking in its writer. I. M. Crombie tells us there is "a nest of confusions" here, arising from Plato's "jumb[ing] mathematical and non-mathematical topics together, and fail[ing] into the bargain to distinguish different senses of such notions as 'through' and 'in virtue of.' " He says: "it would be a useful elementary exercise to make a list of such confusions in this passage."⁴

The interpretation I shall offer here is closer to Shorey's than to Zeller's, and owes no small debt to Crombie's discussion of our passage.⁵ But if my analysis is even approximately correct, it will show that neither is Shorey's view acceptable *in toto*, and that the "confusions" of which Crombie speaks are not in our text but in misunderstandings of it which he shares with many distinguished scholars. Not that Plato's thought here will turn out to be entirely clear or wholly true. But for all its blemishes, both substantive and expository, it will appear, I trust, to be worthy of a philosopher who was not only a pioneer of unsurpassed audacity but also, when full allowance is made for the difficulties which confronted him, a remarkably sane and clear-headed thinker.

I. ON THE MEANING OF *AITIA*

Since so much will turn on the meaning of the word *aitia*,⁶ I must begin by calling attention to the fact that its range of signif-

dissertation: see his citation from the latter in "The Origin of the Syllogism," *Classical Philology*, 19 (1924), 7, n. 2.

⁴ *An Examination of Plato's Doctrine* (London, 1963), II, 169. I shall refer to this work hereafter solely by the author's name.

⁵ As well as to many other authors, the following most of all:

J. Burnet, *Plato's Phaedo* (Oxford, 1911).

A. E. Taylor, *Plato, the Man and his Work*, 4th (rev.) ed. (London, 1937).

F. M. Cornford, *Plato and Parmenides* (London, 1939), pp. 74-80.

J. Moreau, *La Construction de l'Idéalisme Platonicien* (Paris, 1939) pp. 378 ff.

N. R. Murphy, *The Interpretation of Plato's Republic* (Oxford, 1951) pp. 145-148.

To each of these works I shall refer hereafter solely by the author's name.

⁶ Liddell and Scott, *Greek-English Lexicon*, lists the following senses for *aitia*: I. responsibility; II. cause; III. occasion, motive; IV. head, category under which a

icance is far wider than that of the word "cause" as used nowadays both in ordinary speech and philosophical discussions. I can best do so by recalling some of the things that count as straightforward *aitiai* in Aristotle, whose metaphysical preconceptions did not blunt his sensitiveness to the values of the words he used:

1. Why did the Persians invade Attica? Because the Athenians had raided Sardis.
2. Why is this statue so heavy? Because it is made of bronze.
3. Why is he taking after-dinner walks? Because of his health.
4. Why is the angle at the semicircle a right angle? Because it is equal to the half of two right angles.⁷

I have deliberately avoided the word *aitia* in formulating these examples, so as to bring out the fact that to say that *X* is the *aitia* of *Y* comes to precisely the same thing as saying that *Y* happened, or happens, or is the case, *because* of *X*. In proof of this, if proof it needs, I need only refer to the fact that Aristotle speaks of his four

thing comes; V. *case in dispute*. In this paper I shall be concerned exclusively with sense II, which the dictionary renders by "cause"—mistakenly so, in my opinion, since, I shall argue, this sense has a much wider signification than that of the English word as commonly used nowadays (the sense in which we speak of a blow as the "cause" of the shattering of a vase or of air pollution as the "cause" of pulmonary irritation), or as employed by philosophers (see, e.g., "Causation," by R. Taylor, in the *Encyclopedia of Philosophy*, ed. by P. Edwards [New York, 1967]; C. G. Hempel on causal explanation in *Aspects of Scientific Explanation* [New York, 1965], pp. 347 ff.; E. Nagel on causal laws in *Structure of Science* [New York, 1961], pp. 73 ff.)

⁷ Examples 1, 3 and 4 are from the discussion of *aitiai* in the *Posterior Analytics*, II, 11; examples 2 and 3 from the chapter on the four *aitiai* in *Phys.* II, 3. I have recast the phrasing for obvious reasons, and given a different twist to 2 (Aristotle does not refer to the weight of the statue, and does not think in this connection of bronze specifically as a natural kind, but only as formable matter; but he would not hesitate to recognize the kind of explanation illustrated in 2 as a bona fide *aitia*). I disregard problems of Aristotelian exegesis raised by the fact that not all of the four *aitiai* in the *Post. Anal.* are obvious duplicates of the four in the *Physics*. For my purposes it is sufficient to note the prominence of 4 in the *Post. Anal.*, which leaves no doubt that Aristotle would recognize it as a star example of a certain kind of *aitia*, even though he finds it hard to squeeze it into the metaphysical mould which dictates the classification in the *Physics* (and also in the corresponding passage in *Metaphysics*, V, 2).

aitiai as “all the ways of stating τὸ διὰ τί (the *because*).”⁸ Aristotle’s so-called four “causes” are his four “becausees.”

Now not every *because* refers to a cause, though some do, as does the first example: the Athenian raid on Sardis would be a fair example of a temporal antecedent which is the (supposed) sufficient condition of the occurrence of an event, the Persian invasion of Athens. Alternatively, a *because* may refer us to an *aitia* which, while not itself a cause, has definite causal implications. This is brought out well enough in the second example. We could hardly speak of bronze as the “cause” of the weight of a bronze statue: bronze scarcely causes itself to be heavy. What we have here is a natural kind—that is to say, a cluster of properties regularly conjoined, among which is its characteristic specific gravity. Though the laws of the conjunction of these properties are not themselves causal, they have a network of connections with causal laws by means of which we are able to make relevant causal predictions, such as that a bronze statue will outweigh several wooden ones of the same dimensions.

Now consider 3: here it would be not just awkward but positively absurd to speak of the *aitia* as the “cause.” The health for which the ailing man submits to his peripatetic chores does not now exist and may never come to exist, since his walks may not avail to restore it and he might even die on one of them of a heart attack; how then could this nonexistent and perhaps never-to-be-existent thing cause his walks or anything else? To turn the answer to our *why*-question into a statement of a cause we would have to take a detour in full view of the intensional context and make the cause not the health the man expects from his walks but his expectation of getting it from them, backed up by a strong desire to improve his health (stronger than for any of the displaced alternatives). Some philosophers nowadays would deny us even this maneuver, holding that it makes no sense to speak of the cause of an action. Into this controversy I do not propose to enter.⁹ I need

⁸ καὶ πάντως ἀποδοτέον τὸ διὰ τί followed by a listing of the four *aitiai*, *Phys.* 198B5 ff. This is one of the countless passages in which τὸ διὰ τί, τὸ διότι = τὸ αἴτιον in Aristotle (for some of them see H. Bonitz, *Index Aristotelicus*, 177A50 ff.).

⁹ The best defense of the causal account known to me is by D. Davidson, “Actions, Reasons, and Causes,” *Journal of Philosophy*, 40 (1963), 685 ff. Cf.

not in this inquiry, where all that matters is that if we were talking Greek, then, regardless of our philosophical persuasions, we would not have the slightest hesitation in saying that the man's health is the *aitia* of his walks, while in English the most we could do to work the man's health into a causal account of his exertions would be to cite the end-in-view and his desire to attain it as the cause of these actions.

I have left last the mathematical example, the most striking one for my purposes, for here the gap between *aitia* and *cause* is unbridgeable by any ancillary device that will stand up under examination. We are given *P*, "the angle at the semicircle is the half of two right angles," and *Q*, "the angle at the semicircle is a right angle," where *P* is the penultimate formula in the string of formulae which make up the currently acceptable proof of *Q* in the geometry of the time.¹⁰ This leads Aristotle to take *P* as the *aitia* of *Q*, construing the entailment of *Q* by *P*, already proved a valid consequence of the axiom-set of the science, as an adequate ground of the truth of *Q*. Since this entailment is for Aristotle a relation whose relata are abstract items, he would not dream of saying that one of these propositions *causes* the other. Yet that is the way he is made to talk by G. R. G. Mure in the Oxford translation of the *Posterior Analytics*, by W. D. Ross in his *Commentary*, and by countless textbooks, where he is represented as saying that the premises of demonstrative inference are the "causes" of its conclusions.¹¹ Such statements have been defended at times by the claim that Aristotle thinks the premises *causae cognoscendi*.¹² But if *causa* in this time-hallowed phrase means no more than "reason" or "principle" the defense is otiose, since reasons and principles have no causal efficacy; while if it does mean *cause*, the claim is

also M. White, *Foundations of Historical Knowledge* (New York, 1965), ch. V, "Reasons and Causes."

¹⁰ See T. Heath, *Mathematics in Aristotle* (Oxford, 1949), p. 72.

¹¹ αἰτίων τοῦ συμπεράσματος (71B22): "related to them as effect to cause," Mure in the Oxford translation; "causative of the conclusion," Tredennick in the Loeb translation. I have protested elsewhere this venerable mistranslation ("Anamnesis in the *Meno*," *Dialogue*, 4 [1965], 143 ff., n. 15). The present paper is an extended version of the protest.

¹² Leibniz speaks of them as causes "*de notre jugement*" (*Nouveaux Essais*, IV, 17, 3).

false, and may be collapsed by the simple reflection that it is not, in general, true that knowing a given proposition is a sufficient condition of knowing all of the propositions which it entails:¹³ thus one may know the axioms of a system and be ignorant of a whole raft of theorems which a cleverer mathematician would be able to deduce from the same axioms. Aristotle, so far as I know, never made this particular blunder. But even if he had made it, we would still have no good warrant for reading it into the many passages in which he speaks of an entailing premise as the *aitia* of an entailed conclusion, since all such statements make perfect sense if understood to express the simple fact that the premise is a good and sufficient reason for the conclusion.

This brief discussion has shown, I trust, how much more general in signification is the Greek *aitia* than is the current meaning of the word "cause" in English speech. Greek usage would entitle us as a matter of course to speak of something as another's *aitia*, regardless of whether we are referring, as in 1 above, to a straightforward cause, or, as in 2, to a law-like conjunction of properties or factors such that the instantiation of some of them is a sufficient condition of the concurrent instantiation of others, or, as in 3, to the end-in-view of a purposeful agent whose desire to attain it by a certain action we take to be the sufficient condition of his performing the action, or, finally, as in 4, to one proposition as entailing, or implying, another, so that our assurance of the truth of the former warrants equal assurance of the truth of the latter. Here then is the linguistic base from which the whole of the discussion that is to follow will start: the mere fact that Plato speaks of the Forms as *aitiai* in our passage is not of itself the slightest evidence—not even prima-facie evidence—that he wants them to be causes. There are plenty of other things he may want to express by saying, and with the greatest emphasis, that they are *aitiai*. What he does mean can be decided only from the context. Let us proceed to this.

¹³ Cf. E. Nagel, *Sovereign Reason* (New York, 1954), pp. 287 ff.

II. THE "SAFE" BUT "IGNORANT" *AITIA*

Our passage falls into two divisions. Division One (95E-99C) recounts the youthful infatuation of the Platonic Socrates¹⁴ with the physical philosophers and the disappointment in which it ended when he found that all they could offer was material *aitiai* and mechanical causes, while he had become convinced that only teleology provides the "true" (98E) or "real" (99B) *aitiai* of natural phenomena. There is no talk of the Forms as *aitiai*—no mention of them at all—throughout the whole of this division, though the way is prepared for them by the laying out of a series of perplexities whose solution would elude Socrates until he had hit upon the Theory of Forms. This part of Division One I shall discuss at some length in due course. The rest of it I shall ignore. Though its historical importance is incalculable—this is one of the great turning points in European natural philosophy, the conscious abandonment of the line of thought which had led, in the systems of Leucippus and Democritus, to the first rigorously mechanistic conception of the order of nature—its message is familiar and, superficially at least, quite clear. I shall, therefore, bypass it in this paper to concentrate on the far more hazardous task of figuring out what is going on in Division Two (99C-105C), where Socrates, frustrated in his search for teleology, falls back on a second-best method of inquiry of his own.¹⁵

¹⁴ Let me say here once for all that in my opinion the "Socrates" of this whole passage cannot be identified *in toto* with the historical figure, though it may well be that some elements of the account in Division One would fit his intellectual biography, as suggested, e.g., by R. Hackforth, *Plato's Phaedo* (Cambridge, 1955), pp. 127-131 (a book to which I shall refer hereafter solely by the author's name). I shall be using "Socrates" to mean the figure whom Plato makes his mouthpiece in this account, except in a few cases where the context will make it clear that I am referring to the historical Socrates.

¹⁵ "Well, I for my part should be delighted to learn from anyone about this sort of *aitia* [that of 'the good and the fitting,' 99C5]. But since I have been denied this *aitia* (*ἐπειδὴ δὲ ταύτης ἐστέρηθην*) and have failed to either find it myself or learn it from another, would you like me to show you the second journey which I have been pursuing in the search for *aitia*?" (99C-D2). Note that the reference of *ταύτης* in C8 (the subject of *ἐστέρηθην* and also, with the implied change of case, of the infinitives *εὑρεῖν*, *μαθεῖν*) is to *τοιούτης αἰτίας* in C7; what Socrates has failed to discover by his own labors or from

This new method and its distinctive *aitiai* are put forward as the logical pendants of a philosophical "hypothesis,"¹⁶ that of the Theory of Forms or Ideas, which is tersely formulated as follows in the more complete of the two statements in our passage:¹⁷

each of the Forms exists and it is in virtue of participating in them that other things are named after them (*sc.* for Forms) [102A10-B2].¹⁸

The formula has in view three sets of items and the relation of "participation":¹⁹

(1) Forms—that is to say, those of the full-blown theory of Plato's middle period—presented in this dialogue for the first time. The very same terms which he had used to designate the *definienda* of Socrates' moral inquiries in the earlier dialogues—*eidos*, *idea*—he now applies to entities endowed with the follow-

those of others and is prepared to do without for the present is the teleological *aitia* itself. This leaves no room for understanding him to mean (as has been done over and over again in the literature) that his "second-best journey" is (a) an alternative method of searching for *teleological aitia* rather than (b) an alternative method of searching for *aitiai*. The text offers no direct support for (a), since nothing is said of different methods of looking for teleological *aitiai* (the natural philosophers were condemned for failing to look for such *aitiai*, not for looking for them by the wrong method). There would be indirect support for (a) if we could assume that the earlier references to teleological *aitiai* as the "true" or "real" *aitiai* (*tās ōs ἀληθῶς αἰτίας*, 98E1; *τὸ αἴτιον τῷ ὄντι*, 99B3) mean that these are for Plato not only the preferred (most fundamental, most illuminating) *explanations of natural phenomena* (which, of course, they are throughout the Platonic corpus), but *the only admissible aitia* of anything whatever. But there is no case for such an assumption; thus Plato would not hesitate to say with Aristotle that the premises of a deductive argument constitute the *aitiai* of its conclusion, without implying the semantic absurdity that the premises are the *teleological aitia* of the conclusion. For the interpretation I have defended here see N. R. Murphy, pp. 145-146; Shorey, *What Plato Said*, p. 534 and the references given there.

¹⁶ 100B; 102A10-B2.

¹⁷ The first one occurs in 100B5-7. It fails to mention "participation."

¹⁸ This formula is practically identical with the one in *Parm.* 130E5-6. For "named after them" (*ἀντὶ τούτων τὴν ἐπωνυμίαν ἵσχειν*) cf. n. 29 below.

¹⁹ For this trichotomy see Hackforth's notes and commentary on 102A-105B; R. G. Turnbull, "Aristotle's Debt to the 'Natural Philosophy' of the *Phaedo*," *Philosophical Quarterly*, 8 (1955), 131 ff.; D. Keyt, "The Fallacies in *Phaedo* 102A-107B," *Phronesis*, 8 (1963), 167 ff. I am particularly indebted to Turnbull's discussion and regret that limitations of space deny me the opportunity to explain where and why I disagree with certain features of his interpretation.

ing set of categorial properties: they are immutable,²⁰ incorporeal,²¹ divine;²² they cannot be known by means of sense-experience,²³ but only by "recollection."²⁴

(2) The individual persons and objects of ordinary experience, designated by proper names and definite descriptions.

(3) The immanent characters of these individuals, designated by adjectives, abstract nouns, and common nouns. The very same words *also* name Forms. This becomes strikingly clear on those rare occasions on which Plato explicitly juxtaposes the Form with the cognate character to bring out the fact that, though closely connected, they are ontologically distinct. He does so twice in our passage, contrasting "Greatness itself" with "greatness in us" (102D),²⁵ and again "the Opposite itself . . . in the nature of things" (τὸ ἐν τῇ φύσει) with "the opposite itself . . . in us" (τὸ ἐν ἡμῖν),²⁶ and both with "the

²⁰ 78D (cited in n. 44 below); 79D; 80B.

²¹ 79B. Though they are not called ἀσώματα here, this is clearly implied. Cf. my comment on this in "The Third Man Argument in the Parmenides," in R. E. Allen (ed.), *Studies in Plato's Metaphysics* (London, 1965), pp. 231 ff., at p. 247, n. 2. (This paper appeared originally in the *Philosophical Review*, LXIII [1954], 319 ff.)

²² 84A9 (cf. 80B1).

²³ 65A9-66A8.

²⁴ 72E3 ff. With but a single exception, not one of these properties had ever been ascribed by Socrates to the universals whose definitions he sought in the early dialogues. The exception (called to my attention by Prof. John Malcolm) occurs in the *Hippias Major*, where Socrates speaks of Beauty as being "always beautiful" (ἀεὶ καλόν, 292E2 and 4; cf. 294D); but his point in saying this in this earlier dialogue is not metaphysical: he says this only to disqualify an absurdly parochial *definiens* of beauty.

²⁵ I capitalize Form-naming words to distinguish them from the same words used to name characters. Denied this, or any other, inscriptional device, Plato had to use identical linguistic tokens to refer to two distinct entities, distinguishing their reference by context only.

²⁶ This shows that Plato does not reserve the emphatic use of the relative pronoun ("Justice *itself*," etc.) for references to the Forms, though this is his usual practice in his middle period. He may use it upon occasion, as he does here, to refer to a character; he had so used it in the earlier dialogues to refer to the Socratic universal, as W. D. Ross points out (*Plato's Theory of Ideas* [Oxford, 1951], p. 17 and n. 1). Commenting on *Phaedo* 103B5, W. J. Verdenius ("Notes on the *Phaedo*," *Mnemosyne*, S. IV, 11 [1958], 193 ff., at p. 232) says that here "τὸ ἐν ἡμῖν ἐναντίον is part of αὐτὸ τὸ ἐναντίον"; taking the latter phrase to designate the Platonic Form, he infers that Plato's Forms are both

opposite thing" (τὸ ἐναντίον πρᾶγμα)—that is, the individual that has one of two opposite characters (103B).²⁷

It will be convenient to use the following symbols in schematic reference to these items:

the English capitals, *F*, *G*, as character-variables;

their phonetic cognates in the Greek alphabet, *Φ*, *Γ*, as Form-variables;

a, *b*, *c*, as stand-ins for names of individuals, and *x* as a variable whose values are names of individuals.²⁸

What the theory asserts then is the following: for any character, *F*, of any individual, *x*, there exists a homonymous²⁹ Form, *Φ*;

"immanent" and "transcendent." This would be unobjectionable if it were meant to bring out the fact that Plato's theory in the middle dialogues provides both for immanent characters and transcendent Forms. But Verdenius appears to mean more than this; he seems to deny Plato the ontological distinction between τὸ ἐν ἡμῖν ἐναντίον and τὸ ἐν τῇ φύσει. On this see the next note.

²⁷ Cf. also the contrast between "Similarity itself" and "the similarity which we possess" in *Parm.* 130B. This text brings out explicitly, what is implicit in the *Phaedo* texts above, that the word designating a class 3 item has a referent which is ontologically distinct from the referent of the same word when used of a class 1 item. It is, therefore, a mistake to deny the ontological distinctness of class 3 and class 1 items, as did Shorey in commenting on *Phaedo* 103B: "there are really only two things: the idea, and the particular affected by the 'presence' of or 'participation' in the idea. . . . (The text) does not justify the duplication of the idea, which [*a*] is a device employed here only, and [*b*] with full consciousness, for the purpose of the argument" (*The Unity of Plato's Thought* [Chicago, 1903], n. 283; I have interpolated the reference marks). But [*a*] is false, overlooking 102D and *Parm.* 130B. And [*b*] is *ignoratio elenchi*: the fact that the "duplication" here does serve the purposes of the immediate argument in no way implies that it is void of ontological significance.

²⁸ In the paper cited in n. 21 above I had noted the necessity of distinguishing systematically between the adjective, *large*, and the Form, Largeness, in analyzing the regress arguments in Plato's *Parmenides*. I there used "*F*-ness" as a Form-variable. In this paper I turn to the Greek alphabet only for reasons of typographical economy. Were it not for this, I would still prefer to write "*F*-ness" for the Form-variable corresponding to the character-variable "*F*": the recurrence of "*F*" in both symbols brings out more forcefully the linguistic link between "Largeness" and "large" and the ontological bond between the entities they denote.

²⁹ Where *x* is characterized by *F* Plato speaks of *x* as "named" after *Φ*, its "namesake" (cf. *Phaedo* 78E, *Parm.* 133D, *Tim.* 52A), interpreting the predicative statement, "*x* is *F*," as "naming" *x* "*F*"; cf. the formula in *Rep.* 596A, "we are accustomed to posit a single Form for each plurality to which we apply the same name."

and x is F (that is, x has the character, F) if, and only if, x participates in Φ . "Participation" here designates that one-way relation of ontological dependence between temporal things and eternal Forms which is so fundamental a tenet of this philosophy. For Plato nothing could exist in space and time with a definite character, F , if there did not exist a corresponding Φ , while the converse would not be true at all. The existence of a specific Form, say, of a *chiliagon*, would of itself not offer the slightest assurance of its physical instantiation; not only the Form of the Ideal City (*Rep.* 592AB), but infinitely many other Forms as well exist which have been uninstantiated since time began and may so remain forever in Plato's universe. So much of his intention is clear enough. But if we probe further, pressing him to tell us just what it is that happens when a particular F achieves the required "participation" in a Φ , Plato has no definite answer for us, and he is well aware of this fact. He makes no effort to conceal from the reader that he has yet to reach a clear-cut conception of what "participation" involves, speaking of the relation of Beauty to beautiful things as "presence (*παρουσία*) or association (*κοινωνία*) or whatever be the right word for it" (100D5-6).³⁰ Here is something Plato has not yet cleared up to his satisfaction, though he doubtless expects he will, remaining quite certain for the present that some such relation exists and that, were it not for this, the fact that things have characters would be unintelligible.³¹

³⁰ The above translation proceeds on the assumption that Wyttenbach's emendation of *προσγενομένη* in the MS. to *προσαγορευομένη* (which appears to have confirmation in a papyrus: cf. Hackforth's note *ad loc.*) is correct. If we stick to the MS. reading (cf. R. S. Bluck, *Plato's Phaedo* [London, 1955], *ad loc.*) or accept Cornford's emendation (p. 77, n. 1) to *προσγενομένου*, the last clause in the above citation would read "in whatever manner it may come about" or "whatever the relationship may be." The difference will not be great in either case, and will not affect at all the important thing in the citation, *sc.* the avowal of uncertainty in *εἴτε ὅπῃ δὴ καὶ ὅπως*. For Plato's use of *εἴτε ὅπῃ* (augmented in the third example by *εἴτε ὅπως*) to avow uncertainty, see *Parm.* 183D, *τὰ παρ' ἡμῶν ὁμοιώματα εἴτε ὅπῃ δὴ τις αὐτὰ τίθεται*, *Tim.* 48C, *εἴτε ἀρχὴ εἴτε ἀρχὰς εἴτε ὅπῃ δοκεῖ περὶ τὸ νῦν*, and *Laws* 899B, *εἴτε ἐν σώμασι ἐνοῦσαι . . . εἴτε ὅπῃ τε καὶ ὅπως*.

³¹ Though the expectation was never adequately fulfilled, Plato retained the confidence that somehow or other things must "participate" in the Forms. In the *Parmenides*, at the end of the second regress argument, Parmenides does not conclude that the notion of participation has been invalidated, but only that

Armed with this "hypothesis," Socrates feels empowered to give two complementary answers to the question, "Why is x F ?"³² Let us begin with the first, which he calls the "safe" but "simple-minded" and "ignorant" (100DE; 105C) *aitia*. This is just that x is F because it participates in Φ .³³ What could he mean by that? Two interpretations have been advanced, which I take to be mistaken.

On one of them, the Form would be a teleological *aitia*.³⁴ I fail to see how this could be squared with the following feature of our passage: Socrates makes it abundantly clear that he is still, at the time of speaking, "deprived" of the teleological *aitia* he had been looking for.³⁵ But it is no less clear that the alternative line of investigation he is about to explain—the "second journey"—is not something that has popped into his head at just that moment; it is a method of inquiry on which *he has been already engaged*.³⁶ This method takes its starting point from the hypothesis of the Forms. Hence, if Socrates had thought of the Forms as teleological *aitiai*,

"we must look for some other way [i.e., a way other than similitude] by which they participate" (133A5-6).

³² Also, "Why does x come to be F ?" which is the implied question in 101C2-7: "you would loudly protest that you do not know how else each thing comes to be [F] except by coming to participate (*μετασχόν*) in the peculiar essence (*τῆς ἰδίας οὐσίας*) of that [Form] in which it comes to participate (*ἐκάστου οὐ ἂν μετέσχη*) and so here you have no *aitia* of their coming to be two except their coming to participate (*μετάσχεσιν*) in the Dyad—in this all things must come to participate (*μετασχεῖν*), if they are going to be two—and in the Unit if they are going to be one" (101C2-7). For the translation of *μετασχόν*, *μετέσχη*, *μετάσχεσιν*, *μετασχεῖν*, cf. Cornford *ad Parm.* 129A3 (p. 69, n. 1): "As in the *Phaedo*, *μεταλαμβάνειν* (*μετάσχεσις*, *Phaedo* 101C, *μετάληψις Parm.* 131A) means *beginning* to partake when the thing becomes like (*γίνεσθαι*), whereas *μετέχειν* is used of *having* a share and corresponds to *being* like (*εἶναι*); "beginning," however, should be corrected to "coming" for obvious reasons (Cornford does not even use it in his own translation!).

³³ Which may be abbreviated to " x is F because of Φ ," as, e.g., at 101D7-8, *τῷ καλῷ πάντα τὰ καλὰ καλά*.

³⁴ See, e.g., Taylor, p. 203 and n. 2; Bluck, *op. cit.*, p. 199; Crombie, pp. 159 ff. The "confusions" which Crombie finds in the passage arise in part from his assumption that "it is apparently taken for granted that wherever this [i.e., a formal *aitia*] is achieved something like a teleological explanation will be forthcoming" (p. 159; "apparently taken for granted" concedes that nothing of the kind is said, or distinctly implied, in the text).

³⁵ Cf. n. 15 above.

³⁶ Note the preterites: *πεπραγμέναι* in 99D1 and 100B4, *ᾤρησα* in 100A3.

he would not have said that he is still "deprived" of teleological *aitiai*. He would have said that he does have them, though only on the basis of a hypothesis. On this ground the suggested interpretation must be rejected as not only unsupported by the text—there is no mention of teleology after this point in our passage—but as contrary to the unambiguous implications of our text. It is, therefore, unnecessary to inquire how Plato could have assigned, without grave confusion, to his Forms—entities whose most conspicuous feature is their absolute immutability—the teleological function which, both in this dialogue and in the *Timaeus*, pertains exclusively to mind or soul.³⁷

A second interpretation deserves a little—if only little—more consideration. This is that the Form is meant to take the place of Aristotle's "efficient cause." So Aristotle himself expounded our passage, complaining that "Socrates in the *Phaedo*" thought the Forms "sufficient *aitia* of generation,"³⁸ though it is hard to know just how seriously he took this reading, for it is clear from other remarks of his³⁹ that he knows quite well that this cannot be Plato's doctrine.⁴⁰ Echoes of the same reading have recurred in modern

³⁷ The sole pattern of teleological explanation envisaged in the *Phaedo* is that exemplified in the purposeful agency of a mind (the cosmic *nous* of Anaxagoras, 97C1 ff.; the mind of Socrates, 98C2 ff.). In the *Timaeus* those features of the cosmos which admit of teleological explanation are exclusively those which are imputed directly to the activity of divine souls: the Demiurge (46C-E *et passim*) and "his offspring" (69C ff.). And cf. n. 45 below.

³⁸ *De Gen. et Corr.* 335B9-16: "But one party has thought the Forms sufficient *aitia* of generation, as did Socrates in the *Phaedo*: for he too, after reproaching others for having explained nothing, hypothesizes that some existents are Forms, others participants in the Forms, and that each thing is said to be in virtue of the Form, and to become in virtue of participating [in the Form] and to perish in virtue of shedding [the Form]. Hence, if this is true, he must believe the Forms *aitiai* both of becoming and of perishing." Cf. also *Met.* 991B3-4: "In the *Phaedo* the matter is put thus: The Forms are *aitiai* both of being and of becoming."

³⁹ "It is evident from what has been said that he has used only two *aitiai*: that of the essence, and the material *aitia*" (*Met.* 988A8-10).

⁴⁰ In spite of what he *says* in the passages quoted in n. 38 above, what he most likely *means* in the light of the statement quoted in n. 59 is not that Plato himself taught that the Forms are efficient causes, but that since (in Aristotle's opinion) Plato had made no provision for efficient causes as such (*Met.* 992A25-26, "For we [Platonists] say nothing about the *aitia* which is the source of change"—i.e., the "efficient" *aitia*), Plato *would have* to invoke the Forms to do

scholarship in spite of Shorey's vigorous protests. Thus Hackforth (p. 144) claimed that the Ideas are meant to be causes of "qualities of concrete things," if not of concrete things themselves: "Beauty itself is not the cause of a beautiful thing, but of a thing's being beautiful." What sense could be made of this Hackforth does not seem to have considered. If he had done so, I doubt if he would have ever committed his interpretation to print. For since all Forms are absolutely free of spatiotemporal limitations, then if one of them were supposed to be acting on a particular spatiotemporal object, *a*, with a determinate property, *P*, we would have to suppose (i) that it is also acting on all other objects in the universe, including those which do *not* have the property, *P*, and, further (ii) that all other Forms, including Forms corresponding to properties contrary to *P*, are simultaneously acting on *a*. How then (i) could the given Form have that specific causal effect on *a* which would account for its being *P* rather than not-*P*, without having the same effect on all other objects, including those which are not-*P*? And how (ii) could it have any determinate effect on *a* at all, if all those other Forms are simultaneously acting on *a* with contrary effect? The only way to avoid the absurd consequences of the supposition would be to credit Forms with the power to act selectively on different objects in the universe, directing their causal influence to some of them, withholding it from others. And how could Plato have so particularized his Forms as causal agents in the world of space and time without fouling up the most fundamental of his metaphysical principles?⁴¹ Only the most direct and explicit evidence could persuade us that he

this job in addition to that of the "formal" *aitia*. On the charge against Plato in *Met.* 992A25-26, see H. Cherniss, *Aristotle's Criticism of Plato and the Early Academy* (Baltimore, 1944), pp. 383 ff.

⁴¹ See Cherniss, *op. cit.*, p. 452 and n. 397, on the proposition that "the ideas themselves are never made productive agents" in Plato's philosophy. In view of this interpretation, which Cherniss maintains forcefully and consistently throughout this work, he might have done better to avoid speaking of the Ideas as "causes" of their "approximations" in the sensible world (p. 218), "of the particular's being" (p. 373), "of that which in particulars is similar whenever and wherever it occurs" (p. 375). He makes it quite clear, of course, that by saying that the Ideas are "causes" he does *not* mean that they have causal efficacy; what then remains unclear is just what *is* meant, when this is not, to justify the use of the term "cause" in this connection.

blundered so grossly. And there is no such evidence. All we have to go on is the fact that he uses the same language of the relation of the Form to a thing which he would also have used if he were speaking of the relation of a cause to its effect: Φ is that “because of which” ($\delta\iota'$ $\sigma\tau\iota$, 100D1) x is F ; ⁴² it is that which “makes” (ποιεῖ , 100D5) x to be F ; it is the *aitia* of x 's being F (for example, 100C6-7; 101C4-5). Is there no other way of construing these statements that will make better sense?

Consider the following exchange: “Why is this figure a square?” “*Because* it has four equal sides *and* four equal angles. If it had just the four equal sides that would not *make* it a square; it could have been, for all that, a rhombus.” ⁴³ Here it is clear that the “because” which answers our “Why?” is not meant to explain the occurrence of a squareshaped chalk mark on our blackboard. The occurrence is presupposed and no interest is taken in its cause. Our question is not “What made that chalk mark?” nor yet “What made that chalk mark square?” but rather “What *makes* it square?” which could only mean in this context: why do we classify it as a square, rather than as a figure of some other shape? Our question is answered when we are shown that the chalk mark *happens to have*—not how or why *it happened to get*—the shape that meets the logical conditions for being square. The *aitia* we are given is a logical one.

At first sight this may seem suspiciously deflationary of what is said in our text. When Socrates maintains with such dogged emphasis that a beautiful thing “is beautiful for no other reason

⁴² The “because” can also be expressed by the “instrumental” dative: $\tau\hat{\omega}$ $\kappa\alpha\lambda\hat{\omega}$ 100D7, E2; $\mu\epsilon\gamma\acute{\epsilon}\theta\epsilon\iota$ 100E5, etc.

⁴³ Compare: “Those characteristics that are indispensable to an act’s being just are the characteristics which make the act a just act,” Susan Stebbing, *A Modern Introduction to Logic*, 2nd ed. (London, 1933), p. 429. “To teach what makes a member of any class a good member of the class . . .,” R. M. Hare, *The Language of Morals* (Oxford, 1952), p. 102. We find similar uses of “makes” with transparently logical import in Plato’s earlier dialogues: Charmides is asked to consider “what sort of man temperance makes you by being present in you” ($\delta\pi\omicron\iota\omicron\nu$ $\tau\iota\nu\alpha$ $\sigma\acute{\epsilon}$ ποιεῖ η $\sigma\omega\phi\rho\omicron\sigma\acute{\upsilon}\nu\eta$ παροῦσα) and answer accordingly the question, “What is temperance?” (*Charm.* 160D6-7). Hippias agrees that “that which is fitting for each thing is what makes (ποιεῖ) each thing beautiful,” where “fitting” is being considered as a possible *definiens* of “beautiful” (*Hipp. Maj.* 290D).

than because it participates in Beauty" (100C5-6), he is certainly putting forward a thesis which could not be reduced with any plausibility to the logical truth that a particular thing instantiates a concept if, and only if, it satisfies the definition. But such a reduction is the last thing I would wish to suggest. To do so I would have to argue that for Plato logic is a metaphysically non-committal business; and who would want to say such a thing on his behalf? What is his Theory of Forms if not the claim that logical statements presuppose metaphysical ones and would be mumbo-jumbo without them? For Plato the definition of a concept is "the account of the essence" of its Form, Φ .⁴⁴ The reason we can speak significantly and truly of things being square or beautiful, he would insist, is that there exists an incorporeal, immutable, intelligible object, named "Squareness" or "Beauty," in which corporeal, mutable, sensible objects occasionally "participate" and, when they do, are rightly called "square" or "beautiful." So what I have called the "logical" *aitia* is at the same time a metaphysical one for Plato; the logical function of Squareness, Beauty, and so forth, he is convinced, could not be discharged aside from their metaphysical status. But once that is granted, it is the logical function of the metaphysical entity that does the *explanatory* work of the "safe" *aitia*. When I want to know what makes this figure a square rather than a pentagon, what answers my question is not the *existence* as such of the Form, Square—

⁴⁴ "That reality itself (αὐτὴ ἡ οὐσία), of whose essence we give the account (ἥς λόγον δίδομεν τοῦ εἶναι) when we ask and answer our questions, is it ever invariably the same or does it vary? Equality itself, Beauty itself, each 'what is' in itself, the reality (αὐτὸ ἕκαστον ὃ ἔστω, τὸ ὄν), does it ever admit the least alteration?" (*Phaedo* 78D1-5). Burnet rightly remarks *ad. loc.* in his Commentary that "we must take λόγον τοῦ εἶναι together as equivalent to λόγον τῆς οὐσίας or 'definition' (comparing *Rep.* 534B3, διαλεκτικὸν καλεῖς τὸν λόγον ἑκάστου λαμβάνοντα τῆς οὐσίας) and as governing the genitive ἥς." Cf. also *Rep.* 533A8-B2, and also *Laws* 895DE, where the distinction is drawn between the name, the οὐσία it names, and the λόγος of this οὐσία. It is a mistake to suppose that there is any Form of which there is no λόγος. The view that in *Symp.* 211A it is said or implied that of the Form of Beauty "there is no *logos* nor knowledge" (R. C. Cross, "*Logos* and Forms in Plato," *Mind* [63], 433 ff., at p. 443) is not warranted by the text, which only says that Beauty "will not appear" (οὐδὲ φαντασθήσεται) as *logos* or knowledge (since it will appear as that *of* which we have *logos* and knowledge).

countless other Forms also exist which do not help to answer my question—but the logical content of its definition: this is what marks off the Form, Square, from all these other Forms and, isomorphically, marks off every square in our world from instances of all the other figures. And the fact that this logical function is performed by a celestial Form, rather than by a nominalistic *flatus vocis* in no way alters the strictly noncausal import of the formula “*F* in virtue of satisfying the definition.” Plato’s Squareness has no more causal efficacy than has the nominalist’s; it has no power to spawn earthly squares; if it did, so would the Form, Myriagon, and each of the countless others that have had no mundane progeny and never will.⁴⁵

This interpretation of the “*F* in virtue of Φ ” formula frees Plato from so much embarrassment and is so consonant with everything else we know of his metaphysical views that it would have a strong claim on us even without further confirmation.⁴⁶ In point of fact we do get confirmation for it from two distinct data in our passage.

⁴⁵ Note that when Plato says in the *Timaeus* that the Ideal Model may be “likened” to the “father” of generation, the Receptacle to the “mother,” and the things that compose our world to the “offspring” (50D2-4), he makes it very clear that he assigns no causal function to the Ideas in respect of either of the two kinds of causality (teleological and mechanical) which he recognizes in that dialogue (46C7 ff.). The metaphorical remarks in *Rep.* 506E, 507A, and 508B, about the sun as the “offspring” of the Idea of the Good must be interpreted in the light of what Plato means when he says in the *Timaeus* that the whole of the natural universe, not just the sun, is the “offspring” of the Ideas generally, not just of the Idea of the Good. In the *Timaeus* the metaphor is employed in the context of a cosmological scheme which enables us to control the intended meaning in a way which is altogether denied us by the allusive unexplicated use of the metaphor in Book VI of the *Republic*. When the “father” metaphor is used in the *Timaeus* in a context which makes it clear that the metaphor does express (teleological) causal agency, it is applied not to the Forms, but to the Demiurge (28C3-4) in contradistinction to the Forms.

⁴⁶ A number of commentators entertain and, to all appearances, endorse a substantially identical interpretation, only to shy away from it a page or two later, or even a line or two later. To recount these vagaries in detail would require a special monograph (a rather tedious one). A single illustration must suffice. Cornford (in the work mentioned in n. 5, above) begins on p. 77 with an impeccable gloss on 100C4-6: “the fact that this rose is beautiful is the same thing as the fact that this rose partakes of Beauty. We learn nothing about any *cause* which would bring that fact into existence.” But see what happens when he proceeds (immediately) to 100D1-8, where Plato, having spoken three lines earlier of Beauty as (*a*) the reason why (*διότι*) *x* is beautiful, goes on to speak

In the first place, it makes good sense of the fact that this formula is proposed as the "safe" but "ignorant" or "simple-minded"⁴⁷ *aitia*. This is what it would obviously be for anyone who has already accepted the metaphysical "hypothesis" on which this *aitia* is so explicitly pegged.⁴⁸ On this hypothesis, for all x , x is F

of it also as (b) what makes (*ποιεῖ*) x beautiful and to say also (c) that x is beautiful *because of* (*τῷ καλῷ*: instrumental dative; cf. n. 42, above) Beauty, Cornford becomes greatly exercised over the use of "makes" and wonders: "Does it [the 'makes'] mean that the thing's beauty simply *consists in* the presence either of the Form itself or of the character like that of the Form, as we say that the presence of a gay colour 'makes' the thing gay? Or does it mean that the Form, existing independently, *causes* the thing to be (or to become) beautiful by somehow imparting its own character to the thing? This is precisely the dilemma on which Socrates refuses to pronounce. The language might be expressly designed to leave it unresolved" (italics are Cornford's). Now (b), "makes," could not have causal import unless (c), "because of," did, since the latter is used to say the same thing in 100D7 as was said by the use of "makes" at D4-5; and this in turn is the same thing as was expressed by the use of (a), *δι' ὅτι* in D1, the very expression used at C5, where Cornford was certain that it had no causal import; how then could he be left uncertain as to the import of "makes" at 100D5? Moreover, any uncertainty on this score could have been resolved by noting that the "makes" is used in Socratic dialogues (cf. n. 43) where Cornford would not think of reading causal import into it. That Cornford himself cannot be taking very seriously the "dilemma" on which Socrates supposedly "refuses to pronounce" in 100D1-8, appears on p. 79, where he talks as though the supposed "dilemma" has been firmly resolved in favor of its noncausal horn. He remarks on "Simmias comes to partake of Tallness" as the Platonic analysis of "Simmias becomes tall": "This is a description of the same event in other words. Nothing is said as to any 'cause' in our sense, which would make such an event take place as its effect." But he backslides again on p. 80 in glossing 103D (where, e.g., snow perishes at the approach of heat): "Socrates seems to be unaware that only the efficient cause of change he actually describes is a physical cause of precisely the kind which, in the account of his youthful experiences, he had rejected as unsatisfying." If "coming to partake of Tallness" has no causal import, then Socrates would not have the slightest reason for being "unaware" of the existence of physical causes of becoming tall; why then should he be "unaware" of such causes in the case of a thing ceasing to be snow (i.e., melting) and becoming hot when it comes to partake of Heat?

⁴⁷ It is safe: 100D8, E1; 101D1-3; 105B7-C1. It is "simple, artless, and perhaps simple-minded (or stupid, *εὐήθως*)" 100D3-4; "ignorant," 105C.

⁴⁸ Plato, of course, would not apply the same description to the "hypothesis" —i.e., to the Theory of Ideas. Obviously he would not think of *this* as "simple-minded," nor yet as having the kind of "safety" he is now talking about, since he presents it as a "hypothesis" and refrains from claiming that he has proved it conclusively in this dialogue (which, of course, does not imply that he does not think it susceptible of conclusive proof: in the exchange with Simmias at

if, and only if, x participates in Φ . From this it follows with the “safety” of analytic inference that a , or b , or c , or any other x , is F in virtue of participating in Φ . For just the same reason this *aitia* is “ignorant”—that is, uninformative.⁴⁹ Not only does it not profess to give us the slightest help in finding out the cause of any specific happening in the world; it does not even aid us in discovering its correct description: only if we already know that something is F (that is, if we have already so described it) can we proceed on the strength of this *aitia* to say that it is F in virtue of Φ , showing that our description matches the definition and thereby clinching the propriety of calling it “ F ” rather than “ G ” or something else.

Secondly, the interpretation I have offered makes good sense of another thing in our passage to which I have yet to make reference: the fact that the formula “ F in virtue of participating in Φ ” is expected to resolve the puzzles about *aitia* which were displayed in Division One of our passage.⁵⁰ The first four of these (96D8-E4)

107A8-B9 Socrates concedes that the Theory calls for further investigation, but makes no avowal of uncertainty, as was suggested by Jowett’s influential but gratuitous rendering of καθ’ ὅσον δυνατόν μάλιστα ἀνθρώπῳ by “with a sort of hesitating confidence in human reason” now happily corrected to “as far as humanly possible” in the 4th rev. ed., Oxford, 1953). The “safety” of the present *aitia* is due to its being so immediate a consequence of the “hypothesis” that once you accepted the latter *you would risk nothing further* in maintaining this *aitia*.

⁴⁹ This is no doubt what Shorey had in mind when he spoke of the “tautological logic” of the theory that the Ideas are *aitiai* (cf. the citation in the opening paragraph of this paper and the references in n. 3). Unhappily he failed to note that this could only be said of the “safe” *aitia*, and not at all of the “cleverer” one (to be discussed in the next section of this paper) which is conspicuously nontautological in form, this being the very reason why it is called the “clever” *aitia*. Even in the case of the “safe” *aitia* a certain qualification is necessary (cf. n. 78 below) of which Shorey took no notice.

⁵⁰ They are stated in 96D8-97B3, and resolved in 100E5-B7. I do not lump 96C2-D6 with the puzzles: the belief that a man grows by the intake of food and drink involves no absurdity which needs to be cleared up by the machinery of the “safe” *aitia*: it will be noticed that when the clearing up is done in 100E5 ff. there is no mention or allusion to the belief that we grow by taking in food and drink. The point of 96C2-D6 is surely to illustrate *another way* in which an infatuation with the methodology of the natural philosophers could do a tyro far more harm than good: it could lead him to “unlearn” (96C6) familiar truths, persuading him that he knew only those causes which he could formulate in the categories of an elaborate physical system and hence to spurn explanations

are peculiarly mystifying to the modern reader.⁵¹ He is likely to find them not so much puzzles as meta-puzzles: what perplexes him is what there is in any of them that Plato could have thought perplexing. The first pair (98D8-E1) look almost like spoofs. Socrates is supposed to have believed in his benighted youth that if one man overtops another by a head, he does so *because of* a head, and that the same is true of horses: if one horse is taller than another by a head, the *aitia* of its superior height is—the head!⁵² The next pair (E1-4), on the contrary, look like commonplaces: Socrates thought at that time that ten things are more than eight *because* there are two more of them in the ten (than in the eight); and that, given two objects, two and one yards long, respectively, the first will be the longer *because* it exceeds the second by half its own length. One wonders how anyone, no matter how young and callow, could have been expected to swallow the absurdities in the first pair, or blamed for countenancing the platitudes in the second.

Light dawns in the following paragraph, where we come upon a fifth and a sixth puzzle: Why does 1, added to 1, make 2 (96E6-97A5)? Why does 1, divided by 2, make 2 [halves] (97A5-B3)? Here the mode of presentation changes:⁵³ Instead of recounting,

of the usual kind which are cast in homely, everyday language, yet are far more worthy of credence than the windy theorizings which the *physiologoi* would have put in their place. (There is no foundation for Burnet's suggestion *ad locum* [apparently swallowed by Hackforth, p. 131] that "Socrates means that his former beliefs were upset by the question of Anaxagoras [fr. 10], 'for how could hair come from that which is not hair and flesh from that which is not flesh?' " Anaxagoras' highly speculative answer to this question, if true, would not "upset" but only *account for* the belief in 96C8-D5 that a man can increase his bulk by eating and drinking, "when flesh was added to flesh, bone to bone," etc.)

⁵¹ For many years I could not make head or tail of these puzzles, and used to take them as symptomatic of some kind of muddle in Plato's thinking, though without sharing Crombie's confidence that it was the kind of muddle that a tyro in philosophy could diagnose. It was only when I reached the interpretation of the "safe" *aitia* which I present in this paper and saw what kind of solution it would provide to these puzzles that I began to see what gave rise to their perplexities in the first place.

⁵² On the face of it, this is a low-grade pun: the dative, $\tau\eta\ \kappa\epsilon\phi\alpha\lambda\eta$, could be used to mean both "by a head" and "because of a head."

⁵³ The change in tone and perspective is marked by Cebes' question, immediately after the previous puzzles had been laid out: "And how do you think of

poker-faced, mistakes incurred in his distant youth when he had been “utterly blinded” (96E5) by his obsessive attachment to mechanistic aetiology, Socrates now refers to similar errors from his present, entirely different philosophical perspective, and gives us broad hints as to why he can no longer stomach⁵⁴ the answers his previous “method” of thinking had made compelling. Thus, the old answer to the question in the fifth puzzle would have been: the addition of one unit to the other is what makes two of them.⁵⁵ This, he now says, he no longer accepts, and for the following reason:

For I would be astounded if, when each of them was apart from the other (ὅτε μὲν ἐκάτερον αὐτῶν χωρὶς ἀλλήλων ἦν), each was one and they were not then two, but after they approached each other (ἐπλησίασαν ἀλλήλους) *this* became the *aitia* of their becoming two: the conjunction (ἡ σύνοδος) involved in their being put close to each other (τοῦ πλησίον ἀλλήλων τεθῆναι) [97A2-5].

Here at last we see the *gaffe* Socrates had been perpetrating in that period which antedated his discovery of the “safe” *aitia*. He had been confusing the arithmetical operation of addition with a physical process—that of taking things which were “apart” to begin with and putting them “close to each other.”⁵⁶ And he had been supposing that the feasibility of this material process was the

these things *now*?” (96E5). Thereafter Socrates’ verbs change from the past tense in D8-E4 to the present.

⁵⁴ “I do not accept,” 96E7; “I would be [literally, ‘am’] astounded if,” 97A2; etc., winding up at B7 with “I will have no truck with this [method of thinking which gives rise to the puzzles]” (τοῦτον δὲ οὐδαμῇ προσίεμαι).

⁵⁵ 96E8-97A1. To simplify the exposition I abbreviate this puzzle which in the text (Burnet’s, with his expansion) presents the result of adding *A* to *B* as a disjunction: either *B* becomes two, or *A* becomes two, or *A* and *B* taken together become two. The last of the three disjuncts suffices for my purposes above.

⁵⁶ The literal meaning of the verb used for addition, προστίθηναι *A* τῷ *B*, is literally “put *A* next to *B*.” This dead metaphor comes alive in the passage, Socrates shifting back and forth from this verb to variant expressions which refer unmistakably to putting objects close to one another, while he denotes the converse operation not by the usual terms for arithmetical subtraction (ἀφαίρεσις) or division (διαίρεσις), but by words which have strong physical evocations: “splitting” (σχίσις, A7; cf. διασχίσει, A6), “leading apart” (ἀπάγεται, B3), and “separating” (χωρίζεται, B3).

aitia of the logico-mathematical truth that the same items which count as units, if taken disjointly, will count as a pair, if taken conjointly. Looking back at this boner from his present philosophical perspective, Socrates says he would be "astounded" if such a thing were true: he would suffer that peculiar sense of intellectual outrage we all feel when asked to believe a proposition which is not just materially false but logically absurd. For obviously, the things being talked about are two by hypothesis, and they would still be two regardless of whether they were jammed up together in a cupboard or situated in different galaxies a million light-years apart. How absurd then to offer their propinquity as the reason why they are two!⁵⁷ So the puzzle can now be solved or, more exactly, dissolved, Plato's solvent being the "*F* in virtue of Φ " formula.⁵⁸ If things are one in virtue of participating in Unity, two

⁵⁷ This is reinforced by a further objection. If we were to take two-ness as the effect of conjunction we would be faced with the (supposed) paradox that the opposite process of disjunction causes the same effect. Socrates is going on the assumption that if a given process causes a certain effect, the opposite process could not also cause the same effect. There is a fallacy here, but apparently not an obvious one, for I have seen no notice of it in the literature. Even if we were to concede the truth of the assumption, the conclusion would follow only if it were true that the disjunction and conjunction of the same items produced the same effect. But the latter would *not* be true in the two cases Socrates is discussing: he gets two-ness in the first case by conjoining units *A* and *B*; he gets it in the second by disjoining, not the same units, but parts inside each of them. This fallacy does not invalidate the fundamental insight I expound above, however; this can dispense entirely with this additional support, which, as it happens, is unsound.

⁵⁸ This becomes clear in Division Two of our passage where (100E5-B7) all of the puzzles are resolved *seriatim* by applying to each the "*F* in virtue of Φ " formula. This fundamental point, which should be made the pivot of the interpretation of the puzzles, is not even mentioned by Hackforth (p. 131): he gives no indication that the puzzle laid out in 96E6 ff. is stuffed with hints of the correct solution and that in Plato's opinion the "*F* in virtue of Φ " formula provides the correct solution. So it is hardly surprising that Hackforth should labor under the misapprehension that Plato is himself taken in by "unreal problems" (cf. the citation from Hackforth and my comment in the concluding paragraph of this section). Crombie too thinks that Plato wallows in the very confusions which the "safe" *aitia* is meant to clear up. Thus he says that "phrases like 'the putting of one alongside one is not the cause of the occurrence of 2' (101B9-C1) are used without any clear indication whether the question is: (a) 'Why are there two things here?' (to which an answer in terms of putting one thing alongside another would be appropriate); or whether the question is: (b) 'How does the number 2 arise?'" (p. 169; I have interpolated

in virtue of participating in the Dyad, then it will be clear that the "Why?" in "Why do 1 and 1 make 2?" cannot be a physical "Why?" and that its answering "because" must be extracted not from accounts of what happens to objects when they are moved about, but from "accounts of the essence"⁵⁹ of the numbers, One and Two.⁶⁰

All four of the puzzles in 96D8-E4 will yield to the same treatment on the hypothesis⁶¹ that all of them crop up because in this

the reference marks). Crombie, most surprisingly, fails to take into account the fact that for Plato the number, Two, a Form, could no more "arise" than perish and hence could not "arise" from the putting together of two physical objects. Conversely, the fact that, if we did put together two physical objects "here," we would get "two things here" would be as obvious to Plato as to anyone else. Hence Plato could have denounced "because of putting one (object) alongside another" *only* if he thought this an answer to (b); for he would have seen it as a trivially true answer to (a). How then could he have failed to distinguish (a) from (b)?

⁵⁹ Cf. the citation in nn. 44 and 32 above, noting the force of τῆς ἰδέας οὐσίας in the latter. In the *Republic* Plato says that it is the philosopher's job to ask "what is the essence of the One itself" (τί ποτέ ἐστὶν αὐτὸ τὸ ἓν, 524E6; and by the same token of Two and other numbers). When one had done this one would see that the "accounts of the essence" of One and of Two allow for the participation of the same objects, taken singly, in One, taken jointly, in Two (cf. the preceding note *sub fin.*). Cf. *Hip. Maj.* 301D8-9 where much is made of the fact that Two can only be instantiated by a pair of individuals, each of whom is *one*.

⁶⁰ A substantially similar interpretation will be found in Moreau (in the work cited in n. 5 above), my only objections to it being (a) that he has to make Plato a neo-Kantian idealist to bring it off ("La cause de la production du 2, c'est à dire d'un objet de représentation double, ce n'est donc pas le rapprochement ou la séparation dans l'espace, mais dans l'esprit. . . . Toutes les difficultés de cette sorte sont donc levées par l'idéalisme mathématique, qui fait de l'unité un act intellectuel indivisible et du nombre une pure relation," p. 382) and (b) that he does not realize how inappropriate "cause" (cf. the start of the citation) becomes when it is clear that (i) this *aitia* is not a physical one and (ii) Plato is not proposing that a psychological cause be substituted for the physical one. In spite of these objections, I must record my heavy debt to Moreau. I have derived greater help from his discussion of the puzzles in the *Phaedo* than from any other single source.

⁶¹ I say "hypothesis," for certainly there is nothing whatever in the wording of these six lines which states or implies that their puzzles arise because physical factors are being confused with logical ones. For this hypothesis I claim no more than indirect verification from the context. We start at 96A8 with the tale of young Socrates' addiction to a methodology which restricts the quest for *aitiai* to physical causes. We are then given a sequence of six puzzles, all of them illustrative of the same perverse line of thought (cf. Cebes' question in 96E6, which concerns the first four, but is answered by the presentation and

benighted phase of his philosophical evolution Socrates⁶² was confusing physical *aitiai* with logical ones: he was assuming that a material factor, like a head, or the material presence of two units, or the material projection of a part of one thing beyond another could account for the respective statements, all of which are true a priori, and could be accounted for only by referring to the meaning of the terms they use. Thus, take the most interesting of the puzzles: Why are ten things more than eight things? Reflecting on this in Part Two, now that he is well out of that particular fly-bottle, Socrates declares:

So you would be afraid to say [that is, you would *not* say] that the 10 things are more than the 8 in virtue of 2 things, and that it is because of *this* that they exceed, instead of saying that they exceed in virtue of numerousness and because of numerousness [101B4-6].

What Socrates is telling us, put into modern language, is that the reason why the group of ten is more numerous than the group of eight is simply that it satisfies the logico-metaphysical⁶³ conditions

discussion of the last two; and note that the same solution is offered for all six in 100E8-101C9). The last two puzzles are discussed *in extenso* (twelve lines for these two as against six lines for the first four); and these, as I argued above, turn out to be cases of confusion of physical with logical *aitiai*. It is, therefore, reasonable to assume that the first four are also cases of the same confusion and that this would have come out into the open if they had been discussed, instead of merely mentioned, in the text.

⁶² It should be noticed that Plato does not say that *the natural philosophers* had made this confusion, but only that Socrates did so when *he* came under the spell of their teaching. Plato does not hesitate to attack his predecessors sharply for their obnoxious doctrines (see, e.g., *Phil.* 28D-29A; *Tim.* 48B; *Laws* 888E-890A and 967A-D). So it is unlikely that he would have hesitated to lambaste them in this passage if such absurdities as those in 96D8 ff. had figured in their writings. And the fact is that no surviving fragment of their original works indulges in this kind of thing. In the light of these considerations we had best refrain from ascribing such logical solecisms to the physical philosophers and mathematicians of the time (as is sometimes done in the literature: e.g., Crombie, pp. 160-161), and understand Plato to mean in our passage no more than he actually says and directly implies—i.e., that since they had failed to clarify the concept of *aitia* and to sort out its categorially different import for categorially different subject matter, they had left their readers defenseless against such confusions as those recounted in our passage.

⁶³ I say "logico-metaphysical" rather than just "logical," in deference to the point I made earlier, that for Plato the logical relation of a term to the concept under which it falls is at the same time the metaphysical relation of a sensible

of (greater) numerousness. If this were to strike us as uninformative, Plato would agree (this is an “ignorant” *aitia*) but insist that it is not useless on that account, for it would save us from misdirecting our search for *aitiai* to irrelevant factors, such as—in his own formulation of this puzzle—the presence in one group of two units which are not in the other. This would be the reddest of red herrings, unless it were logically related to the relative numerousness of the two groups—for example, by showing that the first has as many units as does the second *and* more units besides, not necessarily *these* two units, nor necessarily *two* units: *any* number of units in the first group over and above those in it which match, unit for unit, the ones in the second group would fulfill the logical requirements of greater numerousness, and thus enable us to say precisely why there are more in the first than there are in the second.⁶⁴ If the “safe” and “ignorant” *aitia* did this kind of work

to an eternal Form. To say that something is the case “in virtue of numerousness and because of numerousness” (the same thing said twice over again for emphasis, first by the instrumental dative, *πλήθει*, and then by an accusative with a preposition, *διὰ τὸ πλήθος*) is expandible into “in virtue of participating in the Form, Numerousness.”

⁶⁴ In this discussion I have deliberately gone beyond what we get in the text, in order to bring out the further implications of Plato’s basic insight. If he had had at his disposal techniques of analysis such as are available nowadays to beginners, he could have offered a general formula to cover all four of the puzzles in 96D8-E4, laying down the contextual definition, “where *A*, *B*, *C* are (positive) magnitudes or cardinals, *A* is greater than *B* if, and only if, there exists a *C* such that $A = B + C$,” and then showing that this definition is satisfied in all four cases: In puzzles 1 and 2, *A* = the height of the first (man or horse); *B* = the height of the second; *C* = the length of a head. In puzzle 3 (the one discussed in the text above), *A* = 10 units; *B* = 8 units; *C* = 2 units. In puzzle 4, *A* = 2 yards; *B* = 1 yard; *C* = $A/2$ yards (= 1 yard). Had Plato been able to clean up the problem in this way, he would have spared his readers two blemishes in his present account which help explain why his sound insight may be so easily missed.

(a) He says “numerousness” (*πλήθει*, *πλήθος*) in 101B6, instead of “greater numerousness,” and “magnitude” (*μεγέθει*) in 101B7, instead of “greater magnitude,” thereby failing to bring out that both are special cases of the “greater than” relation, and that the absolute numerousness or bigness of the things he is talking about is irrelevant to the reasoning.

(b) He gives spurious reasons for rejecting “a head” as the reason why *A* is bigger than *B* in the first two puzzles, saying (101A5-B2) that this would lead to the following “contradictions”: it would imply (i) that the same cause would produce contrary effects (make *A* bigger, *B* smaller) and (ii) that a cause of a

for Plato one can see why he could find it so enlightening while ascribing to it no causal agency whatever.

It is sad then to see him charged by serious scholars with having made the very error which, if I am right, he was the first to spot. Thus Hackforth takes him to task for posing a pseudo-problem in asking for the *aitia* of ten being more than eight:

The question whether the addition of 2 is the cause of 10 being greater than 8 is meaningless, because there is no more a cause of 10 being greater than 8 than there is of Thursday coming after Wednesday [p. 131].

Certainly there is no *cause* here, and who should know this better than does Plato, who gives us, as one showpiece of cockeyed thinking about *aitia*, the puzzle generated by assuming that there is a (physical) cause for the truth that $1 + 1 = 2$? But though there are no causes for such truths, there are most certainly reasons for them, and it was a mark of genius to see that where one type of *aitia*, with its peculiar methodological commitments (those of physical inquiry), is inapplicable, another type of *aitia*, with its entirely different (logico-mathematical) methodology, is applicable, and to make his metaphysical theory the vehicle of this insight.

certain character will produce an effect with a contrary character (the head, a small thing, will cause *A* to be big). The reasoning is fallacious. In (i) there is no contradiction in the same cause producing contrary effects on *different things*; and there is none in (ii), if only because it is not being claimed that the head makes *A* big, but that it makes him *bigger than B*, and there is no reason why a man or a horse has to be a big man or horse in order to be bigger than another man or horse (for other examples of this fallacy in Plato see my "Degrees of Reality in Plato," in *New Essays in Plato and Aristotle*, ed. by R. Bambrough [London, 1965], p. 14). I submit that here, as in the case of the fallacy I pointed out in n. 57 above, Plato's residual confusions and fallacies (which would be entirely understandable in a thinker who lacked the rudiments of the logic of relations) do not cancel the validity of the fundamental insight expressed in the "*F* in virtue of participating in Φ " formula. To see the traps into which Plato falls is to admire all the more the tenacity with which, in spite of these mishaps, he pursued the truth he saw.

III. THE "CLEVER" *AITIA*

We can now consider Socrates' second answer to the "Why is x F ?" question. Instead of mentioning just the one Form, Φ , he now refers us also to another, Γ , so related to Φ that whatever is "named" (that is, characterized)⁶⁵ after Γ , will also be "named" after Φ (103E2-104B4). The first example given of the Γ - Φ relation is the pair, Three-Odd: whatever is a trio will also be odd-numbered. From this and other examples it is clear that he has in view a transitive, nonsymmetrical⁶⁶ relation. He has no technical name for it and is content to use a metaphor: he speaks of Γ "bringing on" Φ .⁶⁷ I shall speak of it as "entailment," extending this term beyond its normal use as a propositional connective and allowing it to connect concepts, as we sometimes do in informal contexts.⁶⁸ The formula then for this *aitia* could be put as follows: " x is F because it participates in Γ and Γ entails Φ "; or, more elaborately: " x is F because, being G , it must participate in Γ ; and since Γ entails Φ , x must also participate in Φ , and hence x must be

⁶⁵ Cf. n. 29 above.

⁶⁶ Plato's relation has to cover both cases such as those of the Three-Odd, Snow-Cold couplings, where the relation is clearly antisymmetric, and also others in which, for all we know to the contrary, Plato perhaps thought of the relation as symmetrical, as in the case of the Fire-Hot coupling. What is certain (from examples like Three-Odd, Two-Even, etc.) is that Plato thinks of participating in Γ as a sufficient, but not also a necessary, condition of participating in Φ .

⁶⁷ Having started off at 103E2 ff. using still more cumbersome language to express the Γ - Φ relation (which I have abbreviated above to "whatever is 'named' by Γ will also be 'named' by Φ "), he shifts casually to $\epsilon\mu\pi\epsilon\phi\epsilon\rho\epsilon\upsilon$ at 104E10 and uses it frequently thereafter (I surmise: simply because it is shorter), varying it with the expression discussed in the preceding note, where the Γ - Φ relation is indicated via the isomorphic G - F relation: if G comes to be present in x , then x will be F . As Shorey points out (p. 11 and n. 3 of the second paper mentioned in n. 3 above; for more examples see Bonitz, *Index Aristotelicus*) the terms $\epsilon\mu\pi\epsilon\phi\epsilon\rho\epsilon\upsilon$ and $\sigma\upsilon\nu\epsilon\mu\pi\epsilon\phi\epsilon\rho\epsilon\upsilon$ as well as some of the other terms used here by Plato to express relations between Forms are also used by Aristotle to express entailment relations between general terms.

⁶⁸ If we were to convert Plato's talk about Forms into set-theoretical language taking Φ , Γ , etc. to name sets, the "bringing-on" relation would denote the inclusion of the "bringer-on" in the "brought-on," not the membership of the former in the latter: Plato clearly has no interest in saying that the Form, Fever, is sick, or that the Form, Fire, is hot.

F." Plato does not spell out any such formula as this. But an examination of his text will show, I believe, that this is what the sketchier phrasings there imply. For what he understands by them we must rely on his examples. There is a flock of them. First, he gives additional arithmetical cases of Γ - Φ linkages: Five-Odd, Two-Even, Four-Even, Ten-Even.⁶⁹ Then, without any apparent shifting of gears, still talking about precisely the same relation, explaining precisely the same *aitia*, he brings in physical, biological, and other examples of Form, Γ , entailing Form, Φ : Fire-Heat, Snow-Cold, Fever-Sickness, Soul-Life.⁷⁰ Does this answer to the "Why is x *F*?" question give us more reason than did the preceding to think that his Forms are meant to be causes?

Let me press one of his examples, where Fever is the *aitia* of a sickness. We may assume the following background: A man displays the cluster of symptoms which would have justified us in classifying him as sick before diagnosing his particular ailment:⁷¹ he suffers from weakness, loss of appetite, pain, and other psychological registers of physical distress. We examine him and see he is very hot.⁷² We infer that he is sick *because* of this.⁷³ Socrates steps in at this point to tell us we are entitled to make this inference only because the man participates in the two Forms, Fever, Sickness,

⁶⁹ 104A4-B2; 105A6-7; 105G9 ff.

⁷⁰ He had already introduced the Forms Hot, Cold, Snow, Fire, to illustrate the relation of incompatibility between Forms (103C10 ff.)—a relation which I leave out of my discussion in this paper to avoid burdening still further its already overburdened exposition.

⁷¹ These symptoms must be sufficient to warrant the classification "sick," but not sufficient to warrant the narrower one "feverish," else we would lose the "cleverness" of the present *aitia*: we would be back in the formally tautologous "safe" and "ignorant" *aitia*. And cf. the next note.

⁷² This is how we must understand "fever" here (taking *pyretos* in its literal sense, "burning heat, fiery heat" [Liddell and Scott, *Greek-English Lexicon*, s.v., I]—i.e., as that "excess of heat" in the body which Plato takes to be a *cause* of a variety of ailments in all of which the patient is feverish: *Tim.* 86A2-3, τὸ μὲν οὖν ἐκ πυρὸς ὑπερβολῆς . . . νοσήσαν . . .), if Fever-Sickness is to parallel the Fire-Heat, Snow-Cold couplings, as it is surely meant to do: if "fever" were understood here to *mean* a species of sickness in the first place, the coupling would not constitute an example of the "clever," i.e. informative, *aitia*.

⁷³ A very substantial inference: if valid, it empowers to infer that he is sick just from knowing that he suffers from "excess of heat," as of course we could not if we were not justified in moving from "he is sick *and* suffers from excess of heat" to "he is sick *because* he suffers from excess of heat" in the first place.

the first of which entails the second. When this is abbreviated to "the Form, Fever, is what makes him sick," it has an alarming ring. It sounds as though the Form were a ghostly stand-in for bacteria. But we need only recall the foregoing argument which, I trust, cleared the Form of imputation of causal agency in the case of the "safe" *aitia*, to assure ourselves that the same clearance can be given it in the case of the present *aitia* as well. If Φ is not expected to be a cause when it is said to "make" x to be F , then by the same token Γ cannot be expected to be a cause when it is said to "make" x to be F .⁷⁴

May we then conclude that here, too, the "makes" in the Platonic formula has a strictly logico-metaphysical force—that no greater causal significance is to be read into "the Form, Fever, makes the man sick" than into "the Form, Sickness, is what makes him sick"? Such had been Shorey's claim when he maintained against Zeller that in the whole of this passage Plato is concerned with logic, not physics, adumbrating a theory of syllogistic inference, not of causal explanation.⁷⁵ This is an attractive interpretation: one could wish it were true. And nothing would have stood in the way of our taking it as true if Plato had given only logical and mathematical examples of the Γ - Φ relation. If we had only Three, Odd, Two, Even, and the like among the examples, then certainly the Γ - Φ coupling could be strictly noncausal. That Jones's family must be odd-numbered because it happens to be a threesome is indeed austere irrelevant to the causal order of the world. Not so when we are told that Jones is sick because he has a fever, that a burning log is hot because it is on fire, that the white stuff on the ground is cold because it is snow. To be sure, none of the entailments holding between the relevant Forms are being credited with causal agency. But they are certainly expected to have causal implications. That the occurrence of fever is the cause of the occurrence of sickness would be a textbook example of a

⁷⁴ Cf. my critique in n. 46 above of the last of the citations from Cornford in that note.

⁷⁵ On pp. 7-8 of the second paper mentioned in n. 3 above. And this is the less extreme of Shorey's claims: cf. the stronger one (which I cited in my opening paragraph and to which I alluded in n. 49 above) that Plato is offering "only a tautological logic." And cf. n. 78 below.

cause in Greek medicine.⁷⁶ And since the Γ - Φ entailment is being offered as the justification of the causal inference, how could it be empty of causal significance? The same would be true of the Fire-Heat and Snow-Cold couplings.⁷⁷ Fire and snow, like bronze in the second example in Section I above, are natural kinds, and the invariance of the concomitance of the characteristic properties in each of them signifies a multitude of causal interconnections with other kinds of matter in the universe. Thus when Socrates maintains that the Form, Snow, is the *aitia* of cold, he is asserting neither the metaphysical absurdity that the Form, Snow, chills selected regions of the universe, nor the semantic absurdity that snow causes itself to be chilly; but what he does assert is nevertheless tied firmly to the causal structure of the world—for example, to the fact that if we raise the temperature beyond a certain point snow must change to water. This “must” is a causal one. And since in Plato’s theory it is grounded in relations of entailment between Forms, it would have to be a fantastically strong “must”: it would have to express a *physical* law that has *logical* necessity. Since Plato claims that the snow of our experience is cold because the Form, Snow, entails the Form, Cold, and since all Forms—those of physical stuffs and processes, no less than those of logic and mathematics—are eternal and sustain only immutable relations to each other, he is implying that the laws of nature, could we but know them, would have the same necessity as do the truths of arithmetic and logic.⁷⁸

⁷⁶ Cf. n. 72 above.

⁷⁷ I ignore the Life-Soul coupling, which raises other problems that cannot be discussed in this paper.

⁷⁸ We could have reached the same conclusion in Sec. I above, if Plato had used examples like Snow and Fire in illustrating the “safe” *aitia*, instead of sticking to logico-mathematical ones (Numerousness, Greatness, One, Two) and to that tantalizing abstraction, Beauty. To simplify the exposition I played his game, using “square” as my own example. Had I shifted to, say, “ x is bronze because it participates in the Form, Bronze,” it would have become apparent that even the “safe” *aitia*, though expressed in a tautological formula, has far-reaching substantive implications for the causal order of the universe: for as I remarked above, the regular concomitance of the properties which make up that natural kind has causal implications; to say that the relevant causal laws are instantiated in x because x participates in a Platonic Form, Bronze, is to credit those laws with absolute immutability and to imply that they may be known a priori.

A theory such as this is not likely to get a sympathetic hearing from philosophers nowadays. Most of us have been brought up to think that the laws of nature are in the last analysis radical contingencies—*de facto* uniformities which we must either exhibit as special cases of still more general *de facto* uniformities or else accept as things for which no further reason can be given. Coming upon Plato's reduction of physical to logical necessity in the *Phaedo*, we may then be tempted to think of it as not only false but unreasonable, wrong-headed, indeed light-headed, a kind of whimsy. We would do well then to reflect that in the modern period, too, a substantially similar view has been propounded by philosophers—by Leibniz, for example, who held that all synthetic and contingent truths must represent necessary, analytic truths, imperfectly comprehended by finite minds; that the neo-Hegelians, from F. H. Bradley to Brand Blanshard, find in Hume's alternative to Leibniz a dissolution of causality into casuality and insist that "being causally connected involve(s) being connected by a relation of logical necessity";⁷⁹ and finally that, to speak from the other, far more populous side of the fence, while it is generally admitted that causal laws must support counterfactuals, the problems of explaining counterfactuals on a regularity theory of the laws of nature is a troublesome one and its solution is still under debate.

There had been no Hume in Plato's past. The physical philosophers had proceeded on the faith that, as Leucippus had expressed it, "nothing happens at random, but everything by reason and by necessity."⁸⁰ But when they looked critically at this axiom,

⁷⁹ *The Nature of Thought*, II (London, 1939), 515; the italics are Blanshard's. Cf. A. C. Ewing, *Idealism* (London, 1934), p. 171: there is an "intrinsic" or "inherent" bond between cause and effect of which, he says, he can only think of "cause and effect as connected by a relation of logical entailment"; and *Proc. of Aristot. Soc.*, supp. vol. 14 (1935), 66: "The cause logically entails the effect in such a way that it would be in principle possible, with sufficient insight, to see what kind of effect must follow from examination of the cause alone without having learnt by previous experience what were the effects of similar causes" (quoted from Ewing by E. Nagel, *The Structure of Science* [New York, 1961], p. 53).

⁸⁰ H. Diels and W. Kranz, *Die Fragmente der Vorsokratiker*⁵, (Berlin, 1934-1937) Frag. B 1.

as Democritus, the last in the succession, was the first to do, all they could find in nature on which to base their faith in rational necessity was *de facto* regularity. He taught, we are informed, that natural explanation reduces to the principle that "things always are or happen thus" and that "there is no sense in looking for a reason for that which always happens."⁸¹ We cannot tell from surviving fragments or reports what conclusions he drew from this remarkable reflection. But regardless of what Democritus may have made of it, we can see with what force Plato could have retorted: "If you must have rational necessity in nature, you cannot get it from regularities which are matters of brute fact. The only kind of rational necessity known to me is that which I find in mathematics⁸² and dialectic. Do you know of any others? If so, explain yourself. Until you do, I will continue to believe that nature could exhibit rational necessity only if its laws mirrored the interrelations of the Forms we explore in logico-mathematical reasoning."

To say this is not, of course, to suggest that Plato's view is unobjectionable. Its most glaring fault is its methodological sterility for natural science. What knowledge of the laws of nature could one hope to secure *a priori* by following out lines of entailment from terms like fire, snow, and fever? The entailments in our passage are depressing commonplaces. But even so, it is not clear that they would warrant the certitude with which they would be credited on this view. How could we know that the Form, Fire, really entails the Form, Heat? It would be no use telling us that we would know this if we had "recollected" the two concepts correctly. For how could we be sure of that? What guarantee would we have that what we learned about fire from our sense-experience, sadly limited by the parochial contingencies of our time and place, would not have led us astray? If there were

⁸¹ *Phys.* 252A32-B1 (= frag. A65 in Diels and Kranz).

⁸² Plato's criticism of contemporary mathematicians in *Rep.* 510C-511D does not imply (or even suggest) lack of confidence in the absolute certitude of mathematics, whose subject matter is eternal (527B7-8) and, therefore, "draws" or "leads" the soul away from the flux to eternal being (524E-525B). (It should be noted that Plato does *not* impute to the mathematicians the absurd assumption that their subject matter consists of visible figures; he says explicitly [510D6-7] that they are *not* reasoning about these.)

stuffs which burn with a cool flame elsewhere in the universe, and we had known of them, our notion of fire would have been different, and then we would not have thought of claiming that the eternal Fire is eternally linked to Heat. It is impossible to tell from our passage to what extent Plato was assailed at this time by such doubts. Here, as elsewhere, he has a way of keeping the spotlight of his discourse on just those areas where he is most confident of the answers, content to leave much else in obscurity. This artful chiaroscuro makes life difficult for anyone who tries to expound his thought systematically. Time and again we come across gaps in his thought, not knowing how he would expect us to fill them. This way of writing philosophy is not to be excused, and I have no desire to excuse it. But this much can at least be said for Plato: his silences are themselves suggestive not of confusion but of a canny, self-critical awareness of the limitations of his theory. The problems he persistently declines to discuss in the middle dialogues are those whose solution eludes him.

This is conspicuously true in the present case. If Plato had really thought we could syllogize our way into the secrets of the natural universe, his confidence in such a fantasy would have been pathetic. But the fact is that he offers us no such pseudo-science of nature in this dialogue.⁸³ His ideas on geography and astronomy he presents only in the framework of a myth.⁸⁴ If not already in this dialogue, then soon after he must have drawn the only conclusion open to a sensible and honest man who had to live with Plato's metaphysical theory: that there can be, strictly speaking, no such thing as *knowledge* of nature—only educated guesses, verisimilitudes, plausibilities. Such a conclusion is clearly implied in the *Republic*. When he drops empirical sciences like physics, biology, and medicine from the curriculum of higher studies, there is no suggestion that their subject matter will be reclaimed at a higher level by dialectic. Forms like Fire, Snow, and Fever never darken the pages of Book

⁸³ He appears to be disclaiming it by emphasizing Socrates' ignorance of natural causes (99C6-9; 100D3; 101C9-D1).

⁸⁴ Including some important scientific doctrines, such as the sphericity of the earth, its stability "at the center of the heavens" (108E4-109A6), and the implied repudiation of the ancient notion of an absolute "up" and "down" (112C1-2).

VII of the *Republic*. His point of view remains the same in this respect when he comes to deal directly and at length with empirical topics, as he does in the *Timaeus*. There the Forms of Fire, Water, and the like are accorded a curious and revealing treatment. Their existence is formally proved,⁸⁵ and they are placed ceremoniously on their metaphysical pedestals, only to be left there and quietly ignored in the rest of the treatise where the workings of nature are explored. The plethora of ingenious explanations of natural phenomena displayed in the sequel is spun out of the theory of the geometrical configuration of matter. We are not told that fire causes water to evaporate, melts metals, cuts up foodstuffs into digestible and assimilable particles because the Forms of Fire, Water, and so forth entail the Forms of the corresponding processes. The *aitiai* of physical, chemical, and biological phenomena are not deduced from "accounts of the essence" of the Forms, but are derived synthetically from the structure of the atom. And what is claimed for them is not certainty, but verisimilitude,⁸⁶ the atomic theory itself being presented as no more than a plausible hypothesis,⁸⁷ having no more than aesthetic elegance⁸⁸ and the saving of the phenomena to recommend it.

I implied at the start of this paper that our passage in the *Phaedo*, rightly understood, is not unworthy of Plato's philosophical stature. The reader can now see why I made this claim and may assess its merits for himself. If my interpretation is correct, Plato has not only distinguished mechanical from teleological causes—this part of his contribution I have not attempted to discuss—but has also come within sight of the still more radical distinction between both of these and the logical *aitia* of classification and entailment. Had he availed himself, as Aristotle was to do, of the expository device of philosophical lexicography, this achievement would have been more perspicuous and also, no doubt, more complete, for in making his thought more explicit he would have attained greater lucidity himself. We should not, however, be put

⁸⁵ 51B7-52A4.

⁸⁶ Cf. my "Disorderly Motion in the *Timaeus*," in R. E. Allen, *op. cit.*, pp. 382-383 and notes.

⁸⁷ 53D4-6.

⁸⁸ 53D7-E8.

off by the fact that at no point does he say in the style of his great pupil and critic, "*aitia* has many different senses." There are other ways of exhibiting distinctions, and one way of doing so is to use them. This, I have argued, is what Plato does in our passage, most successfully of all in the part which has been least understood in the scholarly literature, where he uses the "safe" *aitia* to explode pseudo-problems which arise when the categorial difference between logical and physical *aitiai* is ignored.⁸⁹ If it were then suggested that Plato cannot be after all so clear on this point, else he would not have used indiscriminately arithmetical, physical, and medical concepts when illustrating the "clever" *aitia*, I trust the answer is now apparent from what I have said in the concluding part of the paper. There is no confusion here, but the expression of his firm conviction that all intelligible necessity, physical no less than mathematical, must be grounded on logical necessity, since it represents the interrelations of eternal Forms, be these articulated in discourse or imaged in the physical world. This conviction could easily have set him started in pursuit of a will-o'-the-wisp, a physical science which deduces the laws of nature a priori. It is a mark of good sense, no less than of clear thinking, that in his subsequent writings he claimed the certitude of logical necessity only for propositions of mathematics and dialectic, and was content with a physical theory which, he conceded, was no more than a beautiful guess.

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⁸⁹ I.e., in 96C6-97B3, where he discusses the last two of the six puzzles; and, if my hypothesis concerning the point of the first four is accepted, in 96D8-E4 as well.