

CICERO, *DE FATO* 11–18A

Paragraphs 11–18 of Cicero’s treatise *On Fate* are centred on the logical aspect of the Stoic doctrine of fate as it is defended by its most prominent advocate, Chrysippus. What Cicero aims at doing in these paragraphs is to show, in the first place, that in his attempt to underpin the doctrine of fate by appealing to the alleged effectiveness of divination Chrysippus is committed to a theory of modality which he rejects, namely the theory of modality that originates with Diodorus Cronus; in the second place, that Chrysippus’ effort to evade the commitment to Diodorus’ modal theory by regimenting the formulation of the astrological principles of divination fails; and, finally, that Diodorus’ modal theory is in fact immune to the deterministic implications for which Chrysippus sees himself compelled to reject it.

The first step of this three-stage plan is taken in §§ 11–14. In these paragraphs Cicero tries to show that accepting the astrological principles of divination commits Chrysippus to the view that only that which is or will be the case is possible and that whatever will be the case is necessary. In order to substantiate this claim Cicero puts forward the following argument¹:

Let us suppose that the conditional statement “If anyone has been born with the Dogstar rising, he will not die at sea” is an astrological principle. If this conditional statement is true, the conditional statement “If Fabius has been born with the Dogstar rising, Fabius will not die at sea” is true as well, so that its antecedent, namely the statement “Fabius has been born with the Dogstar rising”, is incompatible with the contradictory opposite of its consequent, namely with the statement “Fabius will die at sea”. But since it is to be supposed as certain that Fabius has been born with the Dogstar rising, there is a further statement which is incompatible with the statement “Fabius will die at sea”, namely the statement “Fabius exists”. Therefore, given the fact that it is certain that Fabius exists, it is not possible that Fabius will die at sea, and, generally speaking, for everything of which it is false to say that it will happen it is impossible that it happen².

There are obviously some gaps in this argument, which Cicero has left to be filled by the reader. The most important move that he has skipped is the move which explains why from the incompatibility of the statement “Fabius has been born with

¹ Translations are borrowed from Sharples 1991 (63 and 65).

² The misleading formulation by means of which Cicero generalizes the conclusion of the argument (“omne igitur, quod falsum dicitur in futuro, id fieri non potest”: § 12; cf. § 13: “quae falsa in futuris dicentur in iis habebis, ut ea fieri non possint”) cannot but have this meaning (cf. Sharples 1991, 167 and 168).

the Dogstar rising” with the statement “Fabius will die at sea” the incompatibility with the latter statement of the statement “Fabius exists” can legitimately be inferred. The missing explanation of the legitimacy of this inference, which is provided by the truth of the conditional statement “If Fabius exists, Fabius has been born with the Dogstar rising”, is nevertheless implicitly given by Cicero’s reference to the fact that it is to be supposed as certain that Fabius has been born with the Dogstar rising. For from its being certain, in the sense of being now unpreventable or necessary, that this is the case it follows that it is also certain, i. e., now necessary, that this is the case if Fabius exists. In other words, the necessity of what the statement “Fabius has been born with the Dogstar rising” asserts to be the case implies the necessity of what the conditional statement “If Fabius exists, Fabius has been born with the Dogstar rising” asserts to be the case.

Since it is in virtue of the laws of modal propositional logic alone that this implication holds, to accept as necessary, or, more precisely, as *now* necessary, that, if Fabius now exists, he has been born with the Dogstar rising is not to “presuppose”, as Tony Long and David Sedley claim, “a variety of essentialism which cannot easily be attributed to the Stoics or to any other Hellenistic school”³, namely to presuppose, as Bob Sharples comments, “that it is an essential part of Fabius’ existing that he be born at a particular time”⁴, but simply to presuppose the necessity of the past. The truth of the conditional statement in question would rest on an essentialist presupposition only if this statement were to be understood not in the sense that *it is now necessary* that, if Fabius now exists, he has been born with the Dogstar rising, but in the sense that *it always has been necessary* that, if Fabius now exists, he has been born with the Dogstar rising.

What Cicero has also failed to mention is the third premise of his argument, namely the statement “It is certain that Fabius exists”. Obviously this statement has to be taken to mean not “It is necessary that there is such a person as Fabius”, but rather “It is now necessary that Fabius now exists”, i. e., “It is now unpreventable that Fabius is still alive now”.

Having filled the gaps in Cicero’s argument we can represent it by means of the following logical derivation, in which the modal operators “*M*” and “*N*” are used in the sense of “It is now possible that ...” and “It is now necessary that ...”, respectively, “*N* α ” being defined as “ $\sim M\sim\alpha$ ”, whereas the individual constant “*a*” stands for the name “Fabius”, and the predicate letters “*E*”, “*R*”, and “*S*” are short

³ Long-Sedley II 1987, 235.

⁴ Sharples 1991, 167.

for the predicates “exists”, “has been born with the Dogstar rising”, and “will die at sea”, respectively:

{1}	(1)	$(\forall x)N(Rx \rightarrow \sim Sx)$	premise 1
{1}	(2)	$N(Ra \rightarrow \sim Sa)$	1: UI
{1}	(3)	$\sim M(Ra \ \& \ Sa)$	2: MPropL
{4}	(4)	$N(Ra)$	premise 2
{4}	(5)	$N(Ea \rightarrow Ra)^*$	4: MPropL
{1, 4}	(6)	$N(Ea \rightarrow \sim Sa)^*$	2, 5: MPropL
{1, 4}	(7)	$\sim M(Ea \ \& \ Sa)$	6: MPropL
{8}	(8)	$N(Ea)^*$	premise 3
{1, 4, 8}	(9)	$N(\sim Sa)^*$	6, 8: MPropL
{1, 4, 8}	(10)	$\sim M(Sa)$	9, def. <i>N</i>

The numerals which are parenthesized number the lines of this derivation, whereas the numerals which are enclosed in braces number the premises of each line. “UI” and “MPropL” abbreviate “rule of universal instantiation” and “rule of inference derived from the laws of modal propositional logic”, respectively. Since the conditional statements which occur in Cicero’s argument are obviously to be understood in the strong sense assigned to such statements by Chrysippus, they have been represented, by means of the necessity operator “*N*” and the sign of material implication “ \rightarrow ”, as expressing strict implications. Formulae to which an asterisk is affixed have no explicit counterpart in Cicero’s text.

As the logical derivation which I have devised shows, the Dogstar Argument, as I should like to call the argument in question, is valid in the sense that its conclusion logically follows from its premises. It is unnecessarily complicated, however, since the formula in line (9), which is logically equivalent to the conclusion in line (10), could easily have been derived from the formulae in lines (2) and (4), so that the third premise in line (8), which is tacitly presupposed by Cicero, could have been dispensed with. The reference to Fabius’ actual existence in lines (5) – (8) is just a red herring⁵.

⁵ See, however, Kreter 2006, 132–57, where an ingenious attempt is made to explain this reference by Cicero’s presumed dependence on a Greek source in which the Dogstar Argument was presented as a restatement of Diodorus’ Master Argument by someone who wanted to defend the latter against the objection raised to it by Chrysippus. For Kreter’s book cf. my review, forthcoming in *Anzeiger für die Altertumswissenschaft* (Innsbruck).

The deficiency of the Dogstar Argument notwithstanding, it must be acknowledged, as Long and Sedley, who rightly criticise the argument as “garbled”⁶, do, that “the same point is better argued”⁷ in § 14. In this paragraph an argument is sketched which amounts to inferring (9) from (2) and (4), in accordance with the valid rule of inference that from a strict implication and the necessity of its antecedent the necessity of its consequent can be inferred.

It should be noted that the Dogstar Argument is regarded by Cicero as a special instance of a more general argument, the conclusion of which is formulated by him, albeit in a rather misleading way, as asserting that for everything of which it is false to say that it will happen it is impossible that it happen (“omne igitur, quod falsum dicitur in futuro, id fieri non potest”: § 12). What are the premises of this argument? An answer to this question can be elicited from the end of § 14, where Cicero raises the following objection to Chrysippus’ attempt to evade the conclusion of the Dogstar Argument by disputing the validity of the rule of inference just mentioned: “But the fact remains that if there is a natural cause for Fabius’ not dying at sea, Fabius cannot die at sea”⁸. This objection suggests that the Divination Argument, as the general argument of which the Dogstar Argument is a special instance may be called, runs as follows:

Every event which will never occur is such that its future non-occurrence is naturally caused (and, hence, necessarily implied) by the past occurrence of some event which already has occurred. But every event which already has occurred is such that it is (now) necessary for it to have occurred. Therefore every event which will never occur is such that it is (now) necessary for it not to occur and, hence, (now) impossible for it to occur.

As we learn from § 13, in Cicero’s opinion Chrysippus is committed, if he endorses the divine predictions, not only to the view that for everything of which it is *false* to say that it will happen it is *impossible* that it happen, but also to the view that for everything of which it is *true* to say that it will happen it is *necessary* that it happen. There is good reason, therefore, to believe that Cicero has in mind two versions of the Divination Argument, the second of which can be paraphrased as follows:

Every event which will sometime occur is such that its future occurrence is naturally caused (and, hence, necessarily implied) by the past occurrence of some event which already has occurred. But every event which already has occurred is

⁶ Long-Sedley II 1987, 235.

⁷ Ibid.

⁸ Translation: Long-Sedley I 1987, 232.

such that it is (now) necessary for it to have occurred. Therefore every event which will sometime occur is such that it is (now) necessary for it to occur.

Using the modal operators “*M*” and “*N*” as before and the tense-logical operators “*F*” and “*P*” in the sense of “It will be the case that ...” and “It has been the case that ...”, respectively, interpreting the variables “*x*” and “*y*” as ranging over events both the occurrence and the non-occurrence of which is conceivable and abbreviating by the predicate letter “*O*” the predicate “occurs”, we can formalize the two versions of the Divination Argument — let us call them version A and version B — as follows (“MPredL” being short for “rule of inference derived from the laws of modal predicate logic”):

Version A

- | | | | |
|--------|-----|---|-----------------------------|
| {1} | (1) | $(\forall x)(\sim FOx \rightarrow (\exists y)(N(POy \rightarrow \sim FOx) \& POy))$ | premise 1 |
| {2} | (2) | $(\forall x)(POx \rightarrow N(POx))$ | premise 2 |
| {1, 2} | (3) | $(\forall x)(\sim FOx \rightarrow \sim M(FOx))$ | 1, 2: MPredL, def. <i>N</i> |

Version B

- | | | | |
|--------|-----|---|--------------|
| {1} | (1) | $(\forall x)(FOx \rightarrow (\exists y)(N(POy \rightarrow FOx) \& POy))$ | premise 1 |
| {2} | (2) | $(\forall x)(POx \rightarrow N(POx))$ | premise 2 |
| {1, 2} | (3) | $(\forall x)(FOx \rightarrow N(FOx))$ | 1, 2: MPredL |

The view expressed by the respective conclusions of the two versions of the Divination Argument is ascribed by Cicero to Diodorus Cronus whom he claims Chrysippus to be committed to following against his will. Is Cicero justified in ascribing to Diodorus the view in question? As for that part of this view which is expressed by the conclusion of version A of the Divination Argument, it is, in a slightly different form, in which Cicero also presents it (cf. §§ 13 and 17), namely in the form of the thesis that only what either is or will be the case is possible, reliably attested by other sources as the view which Diodorus tried to defend with the help of his famous Master Argument. Whether Cicero’s ascription to Diodorus of the view which is expressed by the conclusion of version B of the Divination Argument is warranted, too, depends on whether the Master Argument, which is not mentioned by Cicero, can be modified in such way that it can be used to argue for this view as well.

As we know from the Stoic philosopher Epictetus, to whom we owe the fullest account of it, Diodorus’ argument is based on the following three statements⁹:

⁹ Translation: Long-Sedley I 1987, 230.

- (1) “Every past truth is necessary”,
- (2) “Something impossible does not follow from something possible”,
- (3) “There is something possible which neither is nor will be true”,

where “to be true” means “to be the case”. According to Epictetus’ report, Diodorus, being convinced that these statements form an inconsistent triad, tried to derive from the first two as premises the negation of the third, namely the statement

- (3’) “Nothing which neither is nor will be true is possible”¹⁰.

Unfortunately, on the question how Diodorus managed to accomplish this task Epictetus is silent. In any case Diodorus, who did not have at his disposal the tools of modern formal logic, must have presented his argument in an informal manner; and since in Antiquity this argument “was a favourite subject of learned conversation even at dinner”¹¹, it “cannot have been unduly complex in structure”, as Tony Long and David Sedley rightly point out¹². The most probable guess as to the way in which Diodorus argued seems to me to be the following one, which I have borrowed in a slightly modified form from Arthur Norman Prior¹³:

If it neither is nor ever will be the case that such and such happens, it is not the case that it is and always has been true that the thing in question happens or will happen ($\sim Fp \rightarrow \sim HFp$). But if this is not the case, it is impossible ($\sim HFp \rightarrow \sim MHFp$), because its not being the case is a “past truth”, i. e., a truth about the past and, hence, a necessary truth. But if it is impossible that it is and always has been true that the thing in question happens or will happen, what this impossibility follows from, namely that it is the case that the thing in question happens, is impossible too ($\sim MHFp \rightarrow \sim Mp$), because something impossible does not follow from something possible. Hence, nothing which neither is nor ever will be the case is possible ($\sim Fp \rightarrow \sim Mp$)¹⁴.

If this reconstruction is faithful to Diodorus’ intention, his argument rests on the tacit assumption that it necessarily holds good that if it is the case that such and such happens it is and always has been true that the thing in question happens or will

¹⁰ Translation: *ibid.*

¹¹ Long-Sedley II 1987, 233.

¹² *Ibid.*; cf. also Sedley 1977, 81. Nevertheless the Master Argument seems not to have been entirely easy to understand; for, as Bob Sharples has pointed out to me, it is denounced by Plutarch (*De tuenda sanitate praecepta*, 133 B–C) as causing a headache to those who discuss it over dinner.

¹³ Cf. Prior 1967, 32–33. My modification of Prior’s reconstruction of the Master Argument will be explained below.

¹⁴ For the logical formulae which I have added in parentheses see below.

happen ($N(p \rightarrow HFp)$). That this assumption is not mentioned by Epictetus is not to be wondered at. For from a Stoic point of view it is perfectly legitimate to make it¹⁵.

Using the modal operators “ M ” and “ N ” as before and the tense-logical operators “ F ”, “ P ”, and “ H ”, divergently from my previous use of the first two of them, in the sense of “It is or will be the case that ...”, “It is or has been the case that ...”, and “It is and always has been the case that ...”, respectively, “ $H\alpha$ ” being defined as “ $\sim P\sim\alpha$ ”, we can represent the Master Argument by means of the following logical derivation:

{1}	(1) $P\alpha \rightarrow NP\alpha$	premise 1
{2}	(2) $N(\alpha \rightarrow \beta) \rightarrow (\sim M\beta \rightarrow \sim M\alpha)$	premise 2
{1}	(3) $\sim H\alpha \rightarrow \sim MH\alpha$	1, $\alpha/\sim\alpha$, def. H , def. N
{4}	(4) $N(p \rightarrow HFp)$	additional premise
Λ	(5) $\sim Fp \rightarrow \sim HFp$	theorem
{1}	(6) $\sim HFp \rightarrow \sim MHFp$	3, α/Fp
{2, 4}	(7) $\sim MHFp \rightarrow \sim Mp$	2, α/p , β/HFp , 4: <i>modus ponens</i>
{1, 2, 4}	(8) $\sim Fp \rightarrow \sim Mp$	5, 6, 7: hypothetical syllogism

My use of the operators “ F ”, “ P ”, and “ H ” differs from Prior’s use of them in that the reference to what now is the case, which Prior excludes from their meaning, is included in the meaning of each of them. Thus, what the formulae “ $F\alpha$ ”, “ $P\alpha$ ”, and “ $H\alpha$ ” express, if the operators in question are used in this sense, is the same as what is expressed by the formulae “ $\alpha \vee F\alpha$ ”, “ $\alpha \vee P\alpha$ ”, and “ $\alpha \& H\alpha$ ”, respectively, if they are used in Prior’s sense. Prior represents the sentences which are represented by the formulae appearing on lines (5) and (8) of my logical derivation by formulae which can be translated from the Polish notation used by him into my symbolism as follows:

- (5P) $(\sim p \& \sim Fp) \rightarrow P\sim Fp$,
 (8P) $(\sim p \& \sim Fp) \rightarrow \sim Mp$.

Due to the different senses in which the tense-logical operators are used in (5P), on the one hand, and in (5), on the other hand, (5P) is true, as Prior himself concedes¹⁶, only on the condition that time is discrete, whereas its counterpart (5), being equivalent to

$$(5'P) (\sim p \& \sim Fp) \rightarrow ((\sim p \& \sim Fp) \vee P(\sim p \& \sim Fp)),$$

¹⁵ Cf. Sedley 1977, 98.

¹⁶ Cf. Prior 1967, 49.

in which “*F*” and “*P*” are used in Prior’s sense, is logically true and, hence, does not function as a second additional premise, but as a theorem, the set of premises from which it is derivable being the empty set of statements Λ . It should be noted on this occasion that, strictly speaking, this is true also of the statement usually regarded as the second premise of the Master Argument, which is a theorem of modal propositional logic. What counts in favour of (5) and against (5P) is the fact that the Stoics, who did not share Diodorus’ view that time is discrete¹⁷, do not seem to have had an understanding of the Master Argument on which they could have objected to it that it tacitly presupposes the discreteness of time.

In my previously published work on the Master Argument¹⁸ I took it for granted that in the conclusion of this argument Prior’s “*Mp*” should be replaced by “*MFp*” and, consequently, in its additional premise Prior’s “*p*” by “*Fp*”. What induced me to deem these replacements necessary is the fact that within the framework of tense logic “*p*” is short for “It is now the case that *p*”, from which I inferred that “*Mp*” is short for “It is now possible that it is now the case that *p*” and, thus, abbreviates a type of sentence which cannot be used to make a statement of possibility in that sense of the word “possible” which Diodorus intended to define.

This inference is mistaken, however, for the following reason: If we try to reconstruct Diodorus’ modal theory in terms of modern possible worlds semantics, we must take into account a fact which I have so far ignored, namely the fact that in Diodorus’ theory the role of possible worlds is played by points of time within the real history of the actual world, the relation of accessibility being such that a point of time *t*’ is accessible from a point of time *t* if and only if *t*’ is either identical with or later than *t*¹⁹. This being so, just as in ordinary modal logic a sentence is deprived of its reference to the actual world when a modal operator is prefixed to it, in Diodorus’ system a sentence is deprived, when this is done, of its reference to the present point of time. Consequently, just as in ordinary modal logic a statement of the form “*Mp*”, being true if and only if in some possible world which is accessible from the actual one it is the case that *p*, does not state that in the actual world it is possible that *in the actual world* it is the case that *p*, but simply that in the actual world it is possible that (it is the case that) *p*, in Diodorus’ system a statement of the form “*Mp*”, being true if and only if at some point of time which is accessible from the present one (i. e., at some point of time which is either identical with or later than the present

¹⁷ Cf. Long-Sedley I 1987, 304 (51B 3) and 307.

¹⁸ Cf. Weidemann 1987, 1993, 1994, 1999, and 2000.

¹⁹ As we shall see below, it is on account of his definitions of the modal notions of possibility and necessity that this semantic theory can be attributed to Diodorus.

one) it is the case that p , does not state that it is now possible that p now, but simply that it is now possible that p .

Not only is there no need, then, to replace Prior's " Mp " by " MFp " in the conclusion of the Master Argument, but there is also a strong objection against doing so: If it were in the sense of " $\sim Fp \rightarrow \sim MFp$ " that Diodorus wanted the conclusion of this argument to be understood, he could have acknowledged as statements of possibility those statements only in which the M -operator is immediately followed by the F -operator and, consequently, as statements of necessity those statements only in which the N -operator is immediately followed by the negated F -operator. As the statements which he uses as premises of the Master Argument show, however, he is far from restricting the applicability of the modal notions of possibility and necessity in this way.

In his review of my article "Zeit und Wahrheit bei Diodor" Mauro Mariani extensively discusses the question whether in the conclusion of the Master Argument we should write " Mp " or " MFp "²⁰. For the reasons just stated I cannot subscribe to his concluding remark, flattering though it is, that in writing " MFp " "Weidemann, pur muovendosi nella scia di Prior, sembra cogliere meglio di quest'ultimo il significato della conclusione del 'Dominator' "²¹. As I must ultimately confess, it is undoubtedly Prior who has better grasped the meaning of the conclusion of the Master Argument.

If we compare the Master Argument with version A of the Divination Argument, we can detect, the slightly different senses in which the tense-logical operators are used in each of these two arguments notwithstanding, some striking similarities. Apart from the fact that, for the reason just stated, the possibility operator " M " is not followed in it by the future-tense operator " F ", the conclusion of the Master Argument exactly corresponds to the conclusion of version A of the Divination Argument, whereas the first premise of the former has its exact counterpart in the second premise of the latter. As for the second premise of the Master Argument, which, as I already mentioned, is a theorem of modal logic, it is used in version A of the Divination Argument as the rule of inference which is derivable from the axiom of modal logic that if a statement necessarily implies some other statement the necessity of the former implies the necessity of the latter, to which the theorem in question is logically equivalent. Finally the additional premise of the Master Argument does essentially the same job which is done by that part of the first premise of version A of the Divination Argument according to which the past

²⁰ Cf. Mariani 1997, 30–33.

²¹ Mariani 1997, 33.

occurrence of event y necessarily implies the future non-occurrence of event x , namely the job which is described by Michael J. White as “the transmission of the necessity of the past to the future *via* the conditional necessity of a true entailment”²². Commenting on the Dogstar Argument already Prior aptly remarked: “This is put forward by Cicero as a kind of argument which Diodorus would use. It does have something of the flavour of the Master-argument; like the latter, it is directed against those who argue that we have no control over the past but think we have some over the future; and in both cases the trick appears to be that of conveying the admitted necessity from the past to the future by means of some proposition that necessarily connects the two”²³.

The form in which I have, following Prior, stated the additional premise of the Master Argument must not mislead us into thinking that that to which this premise transmits the necessity of a past truth and, hence, the impossibility of a past falsehood is not the future, but only the present. For we must not forget that the consequent of the conditional statement “If it is now impossible that HFp , it is now impossible that p ”, which is derivable from this premise and premise 2 — see line (7) of the above derivation —, does not assert that it is now impossible that p *now*, but simply that it is now impossible that p . Given the peculiar points of time semantics which underlies Diodorus’ modal theory, a statement of the form “It is now impossible that p ” is true, according to this theory, if and only if at no point of time which is accessible from the present one, i. e., at no point of time which is either identical with or later than the present one, it is the case that p . Thus, the impossibility which is transmitted *via* the additional premise of the Master Argument from the *past* falsehood that it is and always has been the case that it is or will be the case that p to the *present* falsehood that it is the case that p makes of the latter a falsehood which will remain a present falsehood throughout the *future*.

Adopting a terminology suggested by Michael J. White, we may call the additional premise of the Master Argument a “truth-value link” principle and those parts of the respective first premises of the two versions of the Divination Argument which express the necessary implication by the past occurrence of event y of the future non-occurrence of event x and its future occurrence, respectively, “causal-astrological link” principles²⁴. At first sight it might be tempting to suppose that the Master Argument can be turned into an argument which instead of the thesis that “whatever will not be is impossible” yields as conclusion the thesis that “whatever

²² White 1985, 86.

²³ Prior 1967, 116.

²⁴ Cf. White 1985, 81 and 86.

will be is necessary”²⁵ by substituting for its truth-value link principle, which corresponds to the causal-astrological link principle of version A of the Divination Argument, a truth-value link principle that corresponds to the causal-astrological link principle of version B of the Divination Argument. On further consideration, however, the attempt to modify the Master Argument in this way proves to be doomed to failure²⁶.

What comes closest to the desired result of such a modification is an argument that can be represented by means of the following logical derivation:

{1}	(1) $H\alpha \rightarrow NH\alpha$	premise 1
{2}	(2) $N(\alpha \rightarrow \beta) \rightarrow (\sim M\beta \rightarrow \sim M\alpha)$	premise 2
{1}	(3) $H\alpha \rightarrow \sim M\sim H\alpha$	1, def. N
{4}	(4) $Fp \rightarrow HFp$	additional premise
Λ	(5) $N(\sim Fp \rightarrow \sim HFp)$	theorem
{1}	(6) $HFp \rightarrow \sim M\sim HFp$	3, α/Fp
{2}	(7) $\sim M\sim HFp \rightarrow \sim M\sim Fp$	2, $\alpha/\sim Fp$, $\beta/\sim HFp$, 5: <i>modus ponens</i>
{1, 2, 4}	(8) $Fp \rightarrow NFp$	4, 6, 7: hypothetical syllogism, def. N

Unfortunately this argument — let us call it the modified Master Argument — has two shortcomings. First, what on the analogy of the conclusion of the genuine Master Argument we should like to have got as its conclusion is not the statement “ $Fp \rightarrow NFp$ ”, but the statement “ $Fp \rightarrow Np$ ”, which it could yield as conclusion only if in line (5) the theorem “ $N(\sim Fp \rightarrow \sim HFp)$ ” were replaced by the obviously false premise “ $N(\sim p \rightarrow \sim HFp)$ ”; and, second, it rests on the false assumption that Diodorus wanted the first premise of the Master Argument to be understood not only in the sense that whatever is *or has been* the case necessarily is or has been the case, but also in the sense that whatever is *and always has been* the case necessarily is and always has been the case.

It is for the following reason that the assumption just mentioned is false: The conclusion of the Master Argument is a conditional statement which in conjunction with its converse, the truth of which Diodorus seems to have taken for granted, yields a definition of the notion of possibility according to which something is possible if and only if it now is or sometime will be the case ($M\alpha := F\alpha$). Given that something is necessary if and only if its contradictory opposite is impossible, this definition of the notion of possibility implies a definition of the notion of necessity

²⁵ Translations from *fat.* 13: Long-Sedley I 1987, 232.

²⁶ Cf. for this attempt Weidemann 1993, 327–28, and 1994, 18.

according to which something is necessary if and only if it now is and always will be the case ($Na := Ga$, “ $G\alpha$ ” being defined as “ $\sim F\sim\alpha$ ”)²⁷. If then in Diodorus’ view “ $H\alpha$ ” implied “ $NH\alpha$ ”, it would have to imply “ $GH\alpha$ ” as well, what it evidently does not. Consequently, what counts as a “past truth” in the sense of the first premise of the Master Argument is not the truth of whichever true past-tense statement you like, but, as Nicholas Denyer has rightly stressed²⁸, only the truth of a true past-tense statement which is governed either by the operator “ P ” or, what amounts to the same, by the *negated* operator “ H ”. Even if for us the thesis that whatever is *and always has been* the case necessarily is and always has been the case has the same plausibility as the thesis that whatever is *or has been* the case necessarily is or has been the case, for Diodorus it cannot have been plausible at all²⁹.

In view of the foregoing considerations Cicero’s report that in addition to the opinion that whatever will not be the case is impossible Diodorus held the opinion that whatever will be the case is necessary must be dismissed as unreliable³⁰. How is Cicero’s error to be explained? Perhaps he drew his report from a source in which together with the Master Argument the modified Master Argument was to be found; or he took over from a source in which the conclusion of the Master Argument was

²⁷ These definitions of the modal notions are ascribed to Diodorus by Boethius (cf. Long-Sedley I-II 1987, text 38C).

²⁸ Cf. Denyer 1981, 36–37 and 50.

²⁹ Pace Mariani, who (on the basis of Prior’s interpretation of the tense-logical operators) unreservedly maintains that the thesis “ $Hp \rightarrow \sim M\sim Hp$ ” “è un principio tanto plausibile quanto lo è (A1)” (1997, 33), (A1) being Prior’s version of the first premise of the Master Argument, namely “ $Pp \rightarrow \sim M\sim Pp$ ” (cf. 1997, 29). It should be noticed in this connexion that not only “ $Hp \rightarrow \sim M\sim Hp$ ”, but also “ $p \rightarrow \sim M\sim p$ ”, which according to Mariani “esprime la necessità del presente” (1997, 33), does not hold in Diodorus’ system. The necessity of the present can be expressed in this system only as included in the necessity of the past as a limiting case by means of my version of the first premise of the Master Argument, which can be rewritten, if “ P ” is used in Prior’s sense, as “ $(\alpha \vee P\alpha) \rightarrow N(\alpha \vee P\alpha)$ ”. What the premise in question is taken to state, if this version is adopted, is not, as Gaskin claims, “that past *and present* truths are necessary” (1995, 258, note 36; Gaskin’s emphasis), but rather that *past and present* truths are necessarily such that they are *past or present* truths. Diodorus needed the premise in question in the version I suggest, if he did not wish the soundness of his argument to depend on the correctness of the disputed view that time is discrete.

³⁰ Scholars are divided on this matter. Contrary to Denyer, who asserts: “There are several reasons why we may happily disagree with Cicero and not attribute to Diodorus this belief in the necessity of the future” (1981, 51), Gaskin maintains that the ascription of this belief to Diodorus “is warranted” (1995, 306). According to Sedley Cicero’s testimony can be vindicated by interpreting Diodorus’ definition of the notion of necessity as saying that what a *dated future-tense* statement asserts to be the case is necessary if and only if the statement in question is true and always will be true *until the date to which it refers* (cf. Sedley 2005, 247). This interpretation hardly squares with Diodorus’ definition of the notion of possibility, however, which, being understood as saying that something is possible if and only if the statement which asserts it to be the case is true *or sometime will be true*, obviously applies to what is asserted to be the case by *undated* statements only.

misunderstood in the sense of the formula “ $\sim Fp \rightarrow \sim MFp$ ” the mistaken belief that, thus understood, the conclusion of this argument implies the conclusion of its modified counterpart, whose sense is expressed by the formula “ $Fp \rightarrow NFp$ ”. The belief in question is mistaken because from the fact that if every falsehood were impossible every truth would be necessary, which seems to give it support, it does not follow that if every falsehood of the form “ Fp ” is impossible every truth of the form “ Fp ” is necessary.

Cicero’s report of Diodorus’ modal theory reflects an understanding of this theory that is unfaithful to the spirit in which it was conceived. In order to understand this theory correctly it is mandatory to be aware of the peculiarity of the rather unusual semantics on which it rests. What this semantics is like can best be learned from Diodorus’ definitions of the modal notions, which I already mentioned. For if, on the one hand, it holds in general that something is *possible* if and only if it is the case in *some possible world* which is accessible from the actual one and *necessary* if and only if it is the case in *every such world*, and if, on the other hand, it holds in Diodorus’ theory that something is *possible* if and only if it *now is or sometime will be* the case and *necessary* if and only if it *now is and always will be* the case, the role of the set of those possible worlds which are accessible from the actual one is played in Diodorus’ theory by the set of those points of time within the real history of the actual world which are accessible from the present one in that they are either identical with or later than it.

If it is points of time within the real history of the world and not different routes the development of the world can take that play the role of possible worlds in Diodorus’ modal theory, there is only one possible route, according to this theory, which the development of the world admits of. Thus, this theory presupposes the strongly deterministic view that the future does not branch, but is as linear and, hence, fixed as the past. By defining the notions of possibility and necessity in a way that keeps them distinct not only with respect to their intensions, but also regarding their extensions, Diodorus tried to evade the determinism to which he was against his will, and perhaps even without his knowledge, committed by the implicit assumptions of his theory.

Concerning the dispute which his Master Argument provoked among the Stoics we are provided by Cicero with a piece of information which is confirmed by the report we owe to Epictetus³¹. Cicero informs us, in § 14, that contrary to Cleanthes, who denied that every past truth is necessary, Chrysippus endorsed this view, which is expressed by the first premise of the Master Argument, but refused to accept as

³¹ Cf. Long-Sedley I-II 1987, text 38A.

universally valid the rule of inference which permits one to infer from a strict implication and the necessity of its antecedent the necessity of its consequent. By rejecting this rule he implicitly rejected the theorem of modal logic, known as the second premise of the Master Argument, that something impossible does not follow from something possible, whose explicit rejection is ascribed to him by Epictetus.

Chrysippus' rejection of the rule of inference in question is the first of two different moves he made in order to escape his alleged commitment to Diodorus' modal theory³². The second of these two moves, which is extensively discussed by Cicero in §§ 15–16, consists in denying that the astrological principles of divination are adequately formulated as conditional statements and prescribing that they be formulated instead as negated conjunctive statements whose conjuncts are the respective antecedents of the conditional statements they are meant to replace and the respective negations of their consequents. In the case of the Dogstar Argument, for instance, its first premise ought to be formulated, according to Chrysippus' prescription, not as the statement "If someone was born with the Dogstar rising, that man will not die at sea", but rather as the statement "It is not the case both that someone was born with the Dogstar rising and that that man will die at sea" (§ 15)³³.

Cicero's eagerness to ridicule this move as being nothing but an arbitrary and futile regimentation of ordinary language betrays his complete failure to see its point. Chrysippus, by whom conditional statements were conceived of as expressing strict implications, obviously held this sort of statement to be too strong an expression for the merely empirical connexion between an astrological portent and what it portends. Not having at his disposal the conditional "if" formulation to express the weaker concept of material implication, he took advantage of the fact that a conditional statement which gives expression to such an implication is logically equivalent to the negated conjunction of its antecedent with the negation of its consequent.

The point of Chrysippus' second move, which makes his first move — that of disputing the second premise of the Master Argument — pointless, has succinctly been described by David Sedley as follows: "Chrysippus recommends the weaker formulation because it prevents the necessity of the antecedent from being transmitted to the consequent as it would be in the 'if' formulation [...]. It may be a necessary, because past, truth that Fabius was born at the rising of the Dogstar, but

³² Cf. Sharples 1991, 169.

³³ Translation: Sharples 1991, 67.

by sticking to material implication Chrysippus escapes the deterministic consequences of having to label it a necessary truth that Fabius will not die at sea”³⁴.

In § 17 and the first half of § 18 Cicero argues that Diodorus’ position does not have the unwelcome deterministic implications for which Chrysippus tries to avoid being committed to it. The thesis that whatever will be the case is necessary, which he ascribes to Diodorus, is to be understood, according to him, in the quite innocuous sense that a true future-tense statement cannot change its truth-value any more than a true past-tense statement can. Take, for instance, the statement “Scipio will die at night in his bedroom from a violent attack” (§ 18)³⁵. If this statement is true, what it asserts to be the case is necessary, according to the position ascribed by Cicero to Diodorus, not in any deterministic sense, but only in the sense that it is impossible for it to turn from a true statement into a false one³⁶.

That Cicero misunderstood Diodorus’ modal theory was clearly seen already by Leibniz, who in his *Essais de Théodicée*, referring to a letter in which Cicero espouses this theory (*ad fam.* IX 4), rightly points out that the writer of this letter seems not to have sufficiently grasped what follows from Diodorus’ position, because he thought it should be preferred to that of Chrysippus: “Il paroît assés que Ciceron [...] ne comprenoit pas assés la consequence de l’opinion de Diodore, puisqu’il la trouvoit preferable” (§ 170)³⁷.

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³⁴ Sedley 1982, 254.

³⁵ Translation: Sharples 1991, 69.

³⁶ Cf. Sedley 2005, 247–51.

³⁷ Gerhardt 1885, 215.

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