

## THE STOIC ANALYSIS OF TENSE AND OF PLURAL PROPOSITIONS IN SEXTUS EMPIRICUS, *ADVERSUS MATHEMATICOS* x 99

*Adversus Mathematicos* (*M.*) x is the second book dedicated by Sextus to the discussion of the physical doctrines put forward by dogmatic philosophers. An extensive section (*M.* x 85–120) deals with Diodorus Cronus' arguments concerning movement.

*M.* x 99 occurs within the report of a debate on motion and time between Diodorus and some unnamed opponents. The passage is probably corrupt (as was already noticed by Heintz) and contains some observations on plural propositions and tense which have not yet been satisfactorily explained. In this paper I argue that Diodorus' critics are Stoics, propose a new emendation of the text, and attempt a plausible account of the remarks on plural propositions and tense. Thereby some light is shed on a hitherto unexplored region of Stoic logic.\*

### I. THE CONTEXT

After recording two arguments of Diodorus' in support of the thesis that nothing is moving (*κινεῖται*) but something has moved (*κεκίνηται*) (*M.* x 85–90), Sextus sets down five objections to these arguments (*M.* x 90–6). According to the first objection, a perfective proposition (such as 'This has moved') cannot be true at some time if the corresponding continuative proposition (such as 'This is moving') is never true (*M.* x 90–2) ('perfective' and 'continuative' translate *συντελεστικόν* and *παρατατικόν*).

Sextus reports also some answers to these objections (*M.* x 97–111). The reply to the first objection (*M.* x 97–102) he attributes to Diodorus himself. It consists of three examples which are supposed to show that a perfective proposition may be true at some time even if the corresponding continuative proposition is never true. In the first example, Diodorus imagines that *A* married at one time and *B* married one year later. Then the perfective proposition 'These men have married' (formulated while *A* and *B* are being indicated) is now true, but the corresponding continuative proposition 'These men are marrying' (formulated while *A* and *B* are being indicated) is never true: when *A* was marrying, *B* wasn't marrying yet, and when *B* was marrying, *A* wasn't marrying any more, so that at both times 'These men are marrying' (formulated while *A* and *B* are being indicated) was false (its falsity at other times is trivial).

*M.* x 99 contains a criticism of this answer by Diodorus.

### II. WHO ARE DIODORUS' CRITICS?

The terminology employed in *M.* x 99 strongly suggests that Diodorus is being criticised by the Stoics (cf. Frede [1978: 306]). For Stoic logicians often use the noun *πράγμα* ('object') to denote meanings (see S. E. *M.* viii 12; D. L. vii 57; Mates

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[1953–61: 134]). Also ἀμφιβολία ('ambiguity') belongs to the Stoic logical jargon (see D. L. vii 44, 62, 178 and 193, cf. ἀμφιβόλως in Chrysipp. *Quaest. Log.*, *PHerc.* 307 col. ix 14–15 and D. L. vii 47 and ἀμφίβολος in Gal. *Capt.* xiv 595, 16 Kühn, S. E. M. ix 136 and D. H. *Comp.* iv 21, 76, 14 Aujac–Lebel). Even for κατὰ περιλήψιν ('containing'), which has the form κατὰ + accusative of an abstract noun and is equivalent to περιληπτικός, there are Stoic parallels: κατὰ συναγωγὴν ('valid', or 'deductive') is used interchangeably with συνακτικός (see S. E. P. ii 135; 143; 170; M. viii 314; 385); περιλήψις, περιληπτικός and περιλαμβάνω occur in passages reporting logical theories of the Stoics (see S. E. M. xi 9; 29–30; D. L. vii 60); Chrysippus (*Quaest. Log.*, *PHerc.* 307 col. x 9–10) uses περιελημμένα ἀξιώματα ('contained propositions').

Chrysippus criticised Diodorus on points of modal logic and of theory of meaning (see Cic. *Fat.* 12–13; 15; Epict. *Diss.* ii 19, 1–9; Gell. xi 12, 1–3, cf. Cic. *Ac.* ii 143). He also wrote works *About Singular and Plural Expressions* in six books and *About Perfective Propositions* in two books (see D. L. vii 192; 190). Chrysippus' interest in singulars and plurals shows also in some fragments of his *Logical Investigations* (see *PHerc.* 307 fr. i 4–7; coll. i 13; 15–26; ii 21–6; vi 8–9; 11; 13–35; vii 9–22). The passages preserved in columns vi and vii deal with expressions like ἡμέτερος, τούτους τύπτων and ὅλος, i.e. expressions which from the point of view of grammar are singular but have meanings involving the idea of a multiplicity of objects: Chrysippus discussed the question whether such expressions must be considered singular or plural (cf. *Schol. in Dionys. Thr.* 230, 3–9; 545, 18–25; *Simpl. in Cat.* 160, 27–8). Further passages proving that Chrysippus studied the problem of plurals are S. E. M. xi 11–13 (analysed and partly translated below, section VIII), *Schol. in Hom. Il.* i 129, i 47 Erbse and Var. L. x 59. The Stoic attack of S. E. M. x 99, to which Sextus reports no answer by Diodorus, could have taken place after Diodorus' death – its author might be Chrysippus.

According to Marrone [1984: 421–3] Chrysippus applies 'singular' and 'plural' not to predicates and propositions, i.e. meanings, but only to linguistic expressions. This interpretation is supported by a passage of the *Logical Investigations* (*PHerc.* 307 col. ii 21–6) which contains an argument concluding that there are no plural predicates. This is an unreliable ground, because the previous lines (col. ii 10–21) contain two similar arguments concluding, respectively, that there are no past tense predicates nor past tense propositions and that there are no passive predicates: but Chrysippus' work *About What Is Said with Tense* in two books (D. L. vii 190) is listed among treatises concerning propositions (cf. Plu. *Soll. Anim.* iii 961c), and from Diogenes Laertius (vii 64) we learn that, according to orthodox Stoic logic, some predicates are passive. Perhaps in the passage of the *Logical Investigations* mentioned above Chrysippus is exposing objections to his own doctrine or is rejecting certain particular theories of plural, passive and past tense predicates or propositions (this of course is compatible with his acknowledging that there are plural, passive and past tense predicates or propositions).

Chrysippus certainly applies 'singular' and 'plural' to linguistic expressions (as is proved by some of the documents referred to in the second paragraph of this section). But there is no reason to believe that he applies 'singular' and 'plural' *only* to linguistic expressions, and there are at least two grounds for holding that he applies them also to meanings: (i) he treats 'plural' on a par with 'passive' and 'past', which he probably does apply to meanings; (ii) according to Porphyry (quoted by Amm. in *Int.* 44, 23–32), the Stoics distinguish predicates from quasi-predicates by pointing out that predicates are inflected in respect of number, i.e. can be both singular and plural.

## III. THE TEXT

The lines 496, 15–18 Bekker report the Stoic account of the second meaning of an utterance of the sentence ‘These men have married’. The manuscripts and Mutschmann read:

ἕτερον δὲ τὸ κατὰ περίληψιν ἐνικοῦ πράγματος ἐγκεκλιμένου ἀπὸ τοῦ ‘οὗτος ἔγνημεν’ καὶ ἑτέρου ἐνικοῦ τοῦ ‘οὗτος ἔγνημεν’, ὧν πάλιν ἐνικῶν τὰ παρατακτικά ἐστὶν ἀληθῆ, τὸ ‘οὗτος γαμεῖ’ καὶ τὸ ‘οὗτος γαμεῖ’.

The other meaning contains a singular object, inflected from ‘This man has married’, and another singular object, i.e. ‘This man has married’, and the continuative objects corresponding to these singulars are true, i.e. ‘This man is marrying’ and ‘This man is marrying’.

Suppose this text is sound. Then (according to the Stoics) the second meaning of an utterance of the sentence ‘These men have married’ contains two singular objects (περίληψιν ἐνικοῦ πράγματος... καὶ ἑτέρου ἐνικοῦ), i.e. the proposition ‘This man has married’ and the outcome of the inflection of the proposition ‘This man has married’. But the inflection here cannot be inflection in respect of number (otherwise something singular would be the outcome of an inflection in respect of number performed on something already singular). And it cannot even be tense inflection. For, as an outcome of a tense inflection of ‘This man has married’, the context suggests only the continuative proposition ‘This man is marrying’, so that the second meaning of an utterance of the sentence ‘These men have married’ should contain the perfective singular proposition ‘This man has married’ and the continuative singular proposition ‘This man is marrying’: but this result is excluded by the last part of our passage, where ‘This man is marrying’ is described as the continuative proposition *corresponding* to the singulars contained in the second meaning of the utterance. Once inflection in respect of number and tense inflection have been excluded, of what kind could the inflection of ‘This man has married’ be? This difficulty prompts us to think that the text of our passage is corrupt (cf. Heintz [1932: 230] and Hülser [1987–8: 1002]).

Heintz suggests two corrections: (i) τὸ κατὰ περίληψιν [ἐνικοῦ πράγματος] ἐγκεκλιμένον ἀπὸ <ἐνικοῦ πράγματος> τοῦ ‘οὗτος ἔγνημεν’ καὶ ἑτέρου ἐνικοῦ τοῦ ‘οὗτος ἔγνημεν’ (‘the inclusive one, which is inflected from a singular object, i.e. “This man has married”, and from another singular object, i.e. “This man has married”’); (ii) τὸ κατὰ περίληψιν <δυοῖν> ἐνικῶν πραγμάτων ἐγκεκλιμένον ἀπὸ τοῦ ‘οὗτος ἔγνημεν’ καὶ ἑτέρου ἐνικοῦ τοῦ ‘οὗτος ἔγνημεν’ (‘that which contains two singular objects and is inflected from “This man has married” and from another singular object, i.e. “This man has married”’). These emendations have the defect of presupposing that οὗτοι ἔγνημαν is inflected both from the first and from the second οὗτος ἔγνημεν: but inflection is an operation performed on only one item (for instance, a plural expression is the outcome of an inflection in respect of number performed on one singular expression, not on two or more singular expressions).

The expression ἐγκλίνομαι ἀπὸ occurs in Alexander’s report of a theory which echoes Stoic doctrines and resembles to some extent the Stoic analysis recorded by S. E. M. x 99: “Socrates died” is ambiguous [διττόν], and in one sense [...] it is false, whereas in the other sense it is inflected as a whole from “Socrates is dying” [ἐγκέκλιται ὅλον ἀπὸ τοῦ “Σωκράτης ἀποθνήσκει”] and it is true’ (in APr. 403, 15–18). Here ἐγκλίνομαι ἀπὸ describes tense inflection (cf. Simpl. in Cat. 406, 13–14 and ἐγκλιμα in A. D. Synt. 113, 6). Tense inflection is relevant to the Stoic analysis reported by S. E. M. x 99: the context is a discussion of the relationship between the truth conditions of corresponding perfective and continuative propositions, and it

may be plausibly assumed that perfective propositions are conceived as inflected from the corresponding continuative propositions (cf. the passage from Alexander translated above). Hence there are reasons to expect that the expression *ἐγκεκλιμένον ἀπό* is used in our passage to express tense inflection.

Since it may be plausibly assumed that tense inflection is performed on continuative propositions and generates perfective propositions (see above), maybe the text of our passage should be corrected in such a way that *ἐγκεκλιμένον ἀπό* turns out to be used to say that, the perfective proposition ‘This man has married’ is the outcome of a tense inflection performed on the continuative proposition ‘This man is marrying’. Several emendations are possible which yield this result. A first solution is:

τὸ κατὰ περίληψιν ἐνικοῦ πράγματος ἐγκεκλιμένου ἀπὸ <τοῦ ‘οὗτος γαμεῖ’> τοῦ ‘οὗτος ἔγημεν’ καὶ ἐτέρου ἐνικοῦ τοῦ ‘οὗτος ἔγημεν’

that which contains a singular object, i.e. ‘This man has married’ (inflected from ‘This man is marrying’), and another singular object, i.e. ‘This man has married’.

For the position of *τοῦ ‘οὗτος ἔγημεν’* at the end of a noun phrase, cf. S. E. *M.* viii 304: *τοῦ πρώτου τῶν ἐν αὐτῷ τοῦ ‘ἡμέρα ἔστιν’*. The disappearance of *τοῦ ‘οὗτος γαμεῖ’* from the text might be due to haplography (Sextus’ manuscripts have suffered similar damage at *P.* ii 137 and *M.* viii 416). Another possible correction is:

τὸ κατὰ περίληψιν ἐνικοῦ πράγματος ἐγκεκλιμένου ἀπὸ τοῦ ‘οὗτος γαμεῖ’ καὶ ἐτέρου ἐνικοῦ <ἀπὸ> τοῦ ‘οὗτος γαμεῖ’

that which contains a singular object inflected from ‘This man is marrying’, and another singular object also inflected from ‘This man is marrying’.

In this case we assume two stages in the corruption: first *ἀπό* disappeared, then some editor transformed the two occurrences of *τοῦ ‘οὗτος γαμεῖ’* into *τοῦ ‘οὗτος ἔγημεν’*.

#### IV. THE FIRST MEANING OF THE SENTENCE ‘THESE MEN HAVE MARRIED’

According to the Stoics, if the plural sentence ‘These men have married’ is uttered while the persons *A* and *B* are being indicated, the utterance has two meanings. The first is a plural proposition which is equal (i.e. equivalent or identical, cf. *M.* xi 10 and *D. L.* vii 87) to the proposition *οὗτοι συνέγημαν*.

LSJ translates *συγγαμέω* by ‘marry together’ or ‘at the same time’ and refers to our passage and to two places in alchemic treatises. Accordingly, R. G. Bury renders ‘οὗτοι συνέγημαν’ in our passage by ‘These men married together’. At least two arguments may be devised on behalf of this interpretation. First of all, if the first emendation suggested above is correct, in 496, 16–17 Bekker the Stoics say that the second meaning of the utterance of the sentence *οὗτοι ἔγημαν* contains the singular propositions *οὗτος ἔγημεν* and *οὗτος ἔγημεν* (not *οὗτος ἔγημεν* and *αὕτη ἔγημεν*): this strongly suggests that *οὗτοι* should be rendered by ‘these men’ (rather than by ‘these people’ or ‘these ones’) and that *A* and *B* are both males (notice that the Stoics use *αὕτη* or *ἥδε* in the formulation of definite propositions concerning women: see S. E. *P.* ii 106; *M.* viii 252; Alex. *Aphr. in APr.* 402, 20–6). Since in ancient Greece male human beings couldn’t marry one another, *συνέγημαν* should be translated by ‘have married at the same time’. Secondly, the relation of contemporaneity is relevant to the argument because the crucial feature of the situation imagined by Diodorus is that *A* and *B* married at different times.

But we should disregard LSJ’s suggestion and rather translate ‘οὗτοι συνέγημαν’ in our passage by ‘These men have married each other’:

(i) In the alchemic passages referred to by LSJ *συγγαμέω* describes the ‘marriage’ of one substance with another: ‘Moving the hand beneath the melting pot until the substances have married each other [*εως συγγαμήσωσιν αἱ οὐσαίαι*]’ (Ps. Democr. Alch. 51, 6 Berthelot); ‘One will find out that copper has been made in such a way as to have a nature which allows it to marry [*φύσιν ἔχων συγγαμείσθαι*]’ (Zos. Alch. 153, 4–5 Berthelot). In these passages there is no question of contemporary marriages.

(ii) LSJ distinguishes three usages of *σύγγαμος*, the adjective and noun corresponding to the verb *συγγαμέω*: ‘married’ (with the corresponding noun ‘spouse’), ‘connected by marriage’ and ‘sharing a woman’ (with the corresponding noun in the plural ‘rival wives of one man’). The first two usages corroborate the translation of ‘*οὗτοι συνέγημαν*’ in our passage by ‘These men have married each other’. But the last usage does *not* corroborate the rendering of ‘*οὗτοι συνέγημαν*’ by ‘These men have married at the same time’: the prefix ‘*συν-*’ does not indicate contemporaneity (of marriages), it signifies that two or more individuals bear the same relation (a marriage-like link) to one same individual.

(iii) If the Stoics wanted to say that the first meaning of the utterance of the relevant sentence is equal to the proposition ‘These men have married at the same time’, they would probably have used some unambiguous sentence, e.g. *οὗτοι ἔγημαν ἅμα* or *οὗτοι ὁμόσε ἔγημαν* (cf. *M.* x 97).

(iv) The two above arguments in support of the translation of ‘*οὗτοι συνέγημαν*’ in our passage by ‘These men have married at the same time’ are not compelling. As for the first argument, among the meanings of an utterance of a sentence there may well be propositions which are false, even obviously or necessarily false: although in ancient Greece male human beings couldn’t marry, the proposition ‘These men have married each other’ is one of the meanings of an utterance of the sentence ‘These men have married’. (Notice that also ‘Helen has three husbands’, the example discussed in *M.* x 98, is not merely false, but contrary to Greek marital law.) As for the second argument, the fact that the relation of contemporaneity is relevant to the argument does not imply that ‘*οὗτοι συνέγημαν*’ should be rendered by ‘These men have married at the same time’.

If we adopt the first emendation suggested above, *M.* x 99 may be translated as follows:

Here Diodorus argues sophistically and wants to deceive us by an ambiguity [*παρ’ ἀμφιβολίαν*]. For ‘These men have married’ has two meanings. One is plural [*πληθυντικόν*] and is equal to ‘These men have married each other’, which is false. The other meaning contains [*κατὰ περίληψιν*] a singular object [*ἐνικοῦ πράγματος*], i.e. ‘This man has married’ (inflected from <‘This man is marrying’>), and another singular object, i.e. ‘This man has married’, and the continuative objects corresponding to these singulars are true, i.e. ‘This man is marrying’ and ‘This man is marrying’: they come out true with reference to both.

The proposition ‘These men have married each other’, which constitutes the first meaning of the utterance of the sentence ‘These men have married’, is clearly false in the situation imagined by Diodorus: since *B* married one year after *A*, the proposition ‘These men have married each other’ (formulated while *A* and *B* are being indicated) is false (assuming that both *A* and *B* married only once).

## V. THE SECOND MEANING OF THE SENTENCE ‘THESE MEN HAVE MARRIED’

The second meaning of the utterance of the sentence ‘These men have married’ is not a plural proposition, but ‘contains’ two singular propositions: ‘This man has married’ and ‘This man has married’.

The choice of the formula *κατὰ περίληψιν* to describe the second meaning of the utterance of the plural sentence 'These men have married' is at first sight surprising: *κατὰ περίληψιν* does not occur in other documents concerning Stoic logic, and we would expect either *κατὰ συμπλοκήν* (cf. Gal. *Inst. Log.* iv 4, 10, 18; Dexipp. in *Cat.* 22, 12–13; Arist. *Cat.* 2. 1a16–17) or *συμπεπλεγμένον διά* (cf. S. E. *M.* viii 277; 418; 419; 421; *P.* ii 137; 138) or some other expression normally used to describe conjunctive propositions. Why do the Stoics discard *συμπεπλεγμένον διά* (and equivalent expressions) and adopt *κατὰ περίληψιν*?

If the Stoics had chosen *συμπεπλεγμένον διά* (or any equivalent expression), the second meaning of the utterance of the sentence 'These men have married' would have turned out to be the conjunctive proposition 'This man has married and this man has married'. But the Stoics had at least three reasons for disliking this result. First of all, the sentence 'These men have married' does not contain any conjunctive connectives (*συμπλεκτικοὶ σύνδεσμοι*). Hence, an utterance of it should not be taken to mean a conjunctive proposition (cf. D. L. vii 72; Dexipp. in *Cat.* 22, 12–21; Simpl. in *Cat.* 42, 10–13; Gal. *Inst. Log.* iv 6, 11, 5–9). Secondly, the quarrel between Diodorus and the Stoics concerns the relationship between the truth of a perfective proposition and that of the corresponding continuative proposition. But is 'This man has married and this man has married' a perfective proposition? If every perfective proposition must be obtained by inflecting the corresponding continuative proposition, then the proposition 'This man has married and this man has married' is probably not a perfective proposition: for the only corresponding continuative proposition one may think of is 'This man is marrying and this man is marrying', whose genuine perfective inflection must be something of the form '*P* [this man is marrying and this man is marrying]' (where '*P*' is the perfective tense operator) (on the scope of tense inflection see Alex. Aphr. in *APr.* 403, 14–18). Thirdly, if it were insisted that 'This man has married and this man has married' is a perfective proposition and 'This man is marrying and this man is marrying' is the continuative proposition corresponding to it, the Stoics would end up exactly with the situation they want to exclude: for the perfective proposition 'This man has married and this man has married' would be true now and the corresponding continuative proposition 'This man is marrying and this man is marrying' would never be true. For these reasons the Stoics discard *συμπεπλεγμένον διά* (and equivalent expressions).

The formula *κατὰ περίληψιν* seems to convey the idea that the second meaning of the utterance of the sentence 'These men have married' simply 'contains' two propositions, i.e. is not one single proposition, but two separate perfective propositions ('This man has married' and 'This man has married') which are now true and are inflected from corresponding continuative propositions ('This man is marrying' and 'This man is marrying') each of which is true at some time (although at different times). In this way the Stoics have a good criticism of Diodorus' answer.

## VI. THE STOIC ANALYSIS OF THE AMBIGUITY OF THE SENTENCE 'THESE MEN HAVE MARRIED'

At first sight the propositions 'This man has married and this man has married' and '*P* [this man is marrying and this man is marrying]' should be reckoned among the meanings of the utterance of the sentence 'These men have married'. Are the Stoics justified in excluding these propositions from the range of the meanings of the utterance in question?

While explaining why the Stoics want to exclude the proposition 'This man has married and this man has married' from the range of the meanings of the utterance of the sentence 'These men have married', I pointed out two reasons which may be considered also as justifications of this exclusion: an utterance of the sentence 'These men have married', which does not contain any conjunctive connectives, should not be taken to mean a conjunctive proposition; and the proposition 'This man has married and this man has married' can hardly be a perfective proposition.

As for the proposition '*P* [this man is marrying and this man is marrying]', the Stoics could exclude it from the range of the meanings of the utterance of the sentence 'These men have married' because, being the perfective inflection of a *conjunctive* proposition, it should not be taken to be one of the meanings of an utterance of a sentence which does not contain any conjunctive connectives.

## VII. THE STOICS ON PLURAL SENTENCES

The Stoics seem to distinguish a 'collective' from a 'distributive' sense of utterances of plural sentences. If the plural sentence 'These men have married' is uttered while *A* and *B* are being indicated and the utterance is taken in the collective sense, the meaning is the plural proposition 'These men have married each other', in which the plural predicate 'have married each other' resembles a binary relation attributed to *A* and *B*. If the same utterance is understood in the distributive sense, the meaning comprises both the singular proposition 'This man has married' (in which the singular predicate 'has married' is attributed to *A*) and the singular proposition 'This man has married' (in which the singular predicate 'has married' is attributed to *B*): the two singular propositions are not parts of one conjunctive proposition, but remain separate. If the context is appropriate, the utterance understood in the distributive sense yields the joint assertion of the two singular propositions: it does not yield the assertion of the conjunctive proposition consisting of the two singular propositions (on multiple assertion of distinct propositions cf. S. E. *M.* vii 38; *P.* ii 81).

A similar ambiguity arises if the sentence 'These ones are attending a lecture' is uttered while *A* and *B* are being indicated (the example is not taken from ancient sources): if the utterance is taken in the collective sense, the meaning is the plural proposition 'These ones are attending the same lecture', in which the plural predicate 'are attending the same lecture' resembles a binary relation attributed to *A* and *B*; if instead the utterance is understood in the distributive sense, the meaning comprises both the singular proposition 'This one is attending a lecture', in which the singular predicate 'is attending a lecture' is attributed to *A*, and the singular proposition 'This one is attending a lecture', in which the singular predicate 'is attending a lecture' is attributed to *B* (the two singular propositions remain separate).

In general, if the plural sentence 'These *P*' is uttered while the individuals  $A_1, \dots, A_n$  are being indicated, the utterance may be understood in two ways: if it is taken in the collective sense, the meaning is a plural proposition in which the plural predicate '*P*' resembles an *n*-ary relation attributed to  $A_1, \dots, A_n$ ; if instead the utterance is understood in the distributive sense, the meaning is a series of *n* separate singular propositions in each of which the singular predicate corresponding to '*P*' is attributed to a different member of the sequence  $A_1, \dots, A_n$ .

The documents confirm that the Stoics distinguish singular predicates from plural predicates (see above, section II) and that they allow the attribution of one predicate to many objects (see D. L. vii 64; 58; *Suda* s.v. *κατηγόρημα* iii 74, 29–30 Adler). If

a plural sentence is uttered while *A* and *B* are being indicated and the utterance is understood in the collective sense, *A* and *B* are taken as a unitary collection and the predicate attributed to them resembles a *symmetrical* binary relation (because *A* and *B* are not ordered). Maybe also non-symmetrical binary relations have a correlative in the Stoic theory: active predicates, which are incomplete predicates but may be construed with an oblique case and give rise to a complete predicate (see D. L. VII 64; Ammon. in *Int.* 44, 19–45, 6; Egli [1978: 143–4]). If the utterance is understood in the distributive sense, the corresponding singular predicate is distributed to *A* and *B*, i.e. is attributed to each of them separately.

A scholiast commenting on the *Grammar* of Dionysius Thrax formulates a distinction which resembles that between the collective and distributive senses of an utterance of a plural sentence:

There is a big difference between the distributive [ἐπιμεριζομένου] and the collective [περιληπτικού] [...]. The distributive signifies a relationship to all [πρὸς πάντας] by a distribution to each [τοῦ καθ' ἕκαστον ἐπιμερισμοῦ], whereas the collective means the collection [τὴν περιλήψιν] not by distribution, but immediately. (69, 9–13, cf. 241, 21–7; 395, 32–396, 8; 557, 21–5).

The plural definite propositions hitherto considered imply the corresponding singulars: 'These men have married each other' implies all the corresponding singulars 'This man has married', and 'These ones are attending the same lecture' implies all the corresponding singulars 'This one is attending a lecture'. But the suggestion that every plural definite proposition implies the corresponding singulars is refuted by the example of a team of men hauling a boat: 'These men are a complete cause of the dragging of the boat' is a true plural definite proposition, whereas all the corresponding singular definite propositions 'This man is a complete cause of the dragging of the boat' are false. These definite propositions might be hinted at by a passage of Clement (*Strom.* VIII 9, 31, 1) reporting a discussion in which technical expressions of the jargon of the Stoic theory of causality are employed.

### VIII. PLURAL QUANTIFICATION

A passage from Sextus prompts us to think that Chrysippus distinguishes between 'singular quantification' and 'plural quantification':

According to Chrysippus also what is said by means of 'Of beings some are good, others evil, others intermediate' is equivalent to the universal [καθολικόν] proposition 'If some things are beings, they either are good or are evil or indifferent'. But this universal proposition is false, since something false is subordinated to it [ὑποτασσομένου τινὸς αὐτῷ ψεύδους]. For, they say [φασιν], take two objects, the one good and the other evil, or the one good and the other indifferent, or an evil and an indifferent. Then 'Of beings, this is good' is true whereas 'These are good' is false: for they are not good, but the one is good and the other evil. Also 'These are evil' is false: for the two objects are not evil, but only one of them is. The same holds for indifferent things: for 'These are indifferent' is false, just as 'These are good or evil'. The objection is more or less this, but it seems not to affect Xenocrates, because he didn't use plural cases [πληθυντικαῖς πτώσεσι] which would cause a falsification [ψευδοποιηθῆναι] of the division by means of an indication of things of different kinds [ἐπὶ τῆς τῶν ἑτερογενῶν δειξέως]. (*M.* XI 11–14)

The context of the passage is the discussion of Xenocrates' division 'Every being either is good or is evil or is neither good nor evil' (*M.* XI 4). Chrysippus is probably the author of the falsification of the universal proposition 'If some things are beings, they either are good or are evil or are indifferent', a falsification which takes place in the second part of the passage (the plural 'they say' probably either alludes to the



members of the Stoic school, who endorsed Chrysippus' analysis, or refers back to οἱ τεχνουργοί mentioned in *M.* xi 8, namely the authors of introductory dialectical handbooks which were Sextus' immediate sources and reported Chrysippus' views – cf. *M.* viii 428).

Chrysippus' argument presupposes a distinction between singular universal propositions (e.g. 'Every being is either good or evil or neither good nor evil') and plural universal propositions (e.g. 'If some things are beings, they either are good or are evil or are indifferent') (cf. *M.* xi 3–4; *Plu. Comm. Not.* xxxix 1080c). Chrysippus picks out a critical case, i.e. a singular universal proposition which is true whereas the corresponding plural universal proposition is false. Take two objects *A* and *B*, one of which is good and the other evil (also a good and an indifferent object or an indifferent and an evil object would do). The plural definite proposition 'These are good' (formulated while *A* and *B* are being indicated) is false, because it is not the case that *A* and *B* are both good. For similar reasons also the plural definite propositions 'These are evil' and 'These are indifferent' (both formulated while *A* and *B* are being indicated) are false. Chrysippus then infers the falsity of 'These either are good or are evil or are indifferent' (formulated while *A* and *B* are being indicated), and from this follows the falsity of the plural universal proposition 'If some things are beings, they either are good or are evil or are indifferent' – the truth of the proposition 'These are beings' (formulated while *A* and *B* are being indicated) is not mentioned explicitly by Chrysippus, but probably plays some role. As it is pointed out at the end of the passage (*M.* xi 14), the falsification described cannot apply to the corresponding singular universal proposition: the singular definite proposition 'This either is good or is evil or is indifferent' (formulated while an arbitrarily chosen object is being indicated) cannot be falsified.

The crucial step in Chrysippus' falsification is the inference from the falsity of 'These are good', 'These are evil' and 'These are indifferent' (all formulated while *A* and *B* are being indicated) to the falsity of 'These either are good or are evil or are indifferent' (formulated while *A* and *B* are being indicated). This inference presupposes that in the plural proposition 'These either are good or are evil or are indifferent' (formulated while *A* and *B* are being indicated) the attribution of the plural predicate 'either are good or are evil or are indifferent' to *A* and *B* resembles the attribution of a binary relation: if instead it had been equivalent to the attribution of the corresponding singular predicate 'either is good or is evil or is indifferent' to each of *A* and *B*, Chrysippus would not have obtained the result he needs. Hence *M.* xi 11–14 confirms one of the results of the analysis of *M.* x 99: in a plural definite proposition the plural predicate resembles a relation attributed to the indicated objects.

Thus, despite the loss of the works of the Stoic logicians, we have reasons to believe that they distinguished between a collective and a distributive sense of utterances of plural sentences, and that this distinction covered also utterances of quantified sentences.

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